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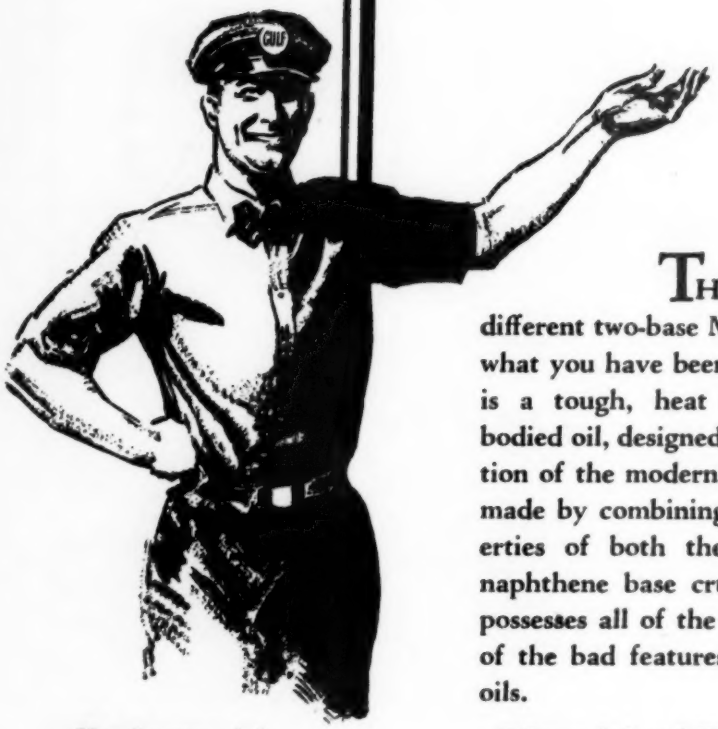

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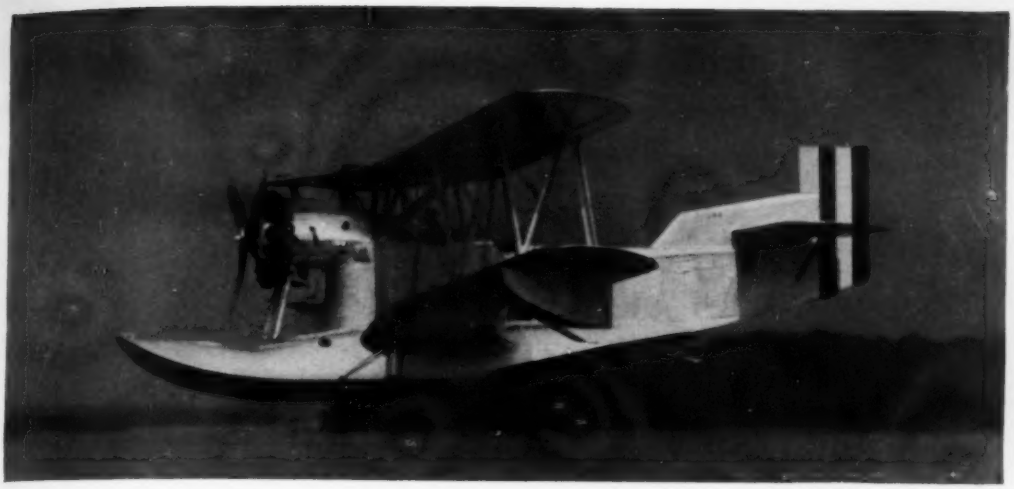

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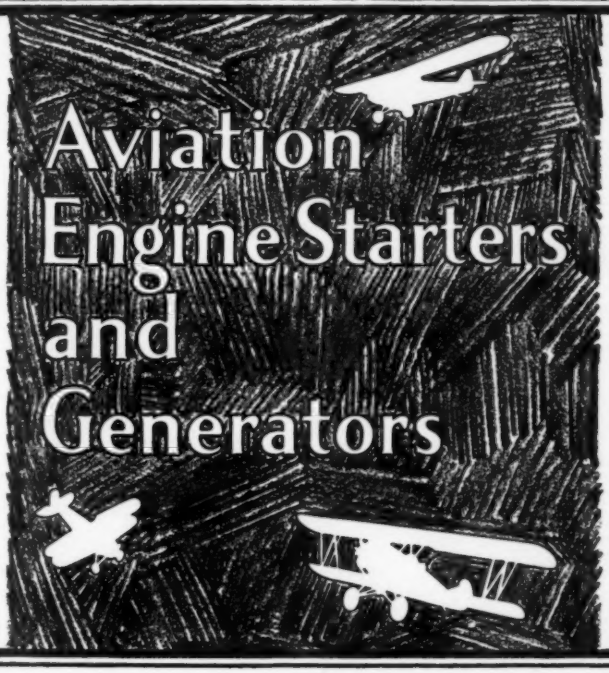

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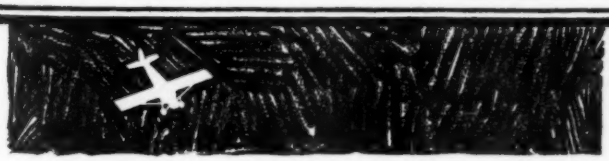

WE BUILD A NAVY

By LIEUTENANT COMMANDER HOLLOWAY H. FROST, *U. S. Navy*

xvi+502 pages, 33 full-page illustrations, $4.00 postpaid

The following are typical of the reviews of this book:

He patterns after Theodore Roosevelt and Admiral Mahan, both of whom found something to criticize in operations of the War of 1812. Enthusiasm for the service the author admits. He is sometimes "colorful," but refrains from gasconade.

The author is sound when he says of Paul Jones: "He had founded the tradition of the United States Navy—the only asset which our Navy had when reëstablished in 1798." What an education to junior officers he has been ever since!

There were other fine seamen, other real heroes, to come in the period the author sets himself: John Rodgers, who, calling his crew to quarters at the opening of the War of 1812, addressed them:

"Now, lads, we have got something to do that will shake the dust out of our jackets. War is declared. We shall have another dash at our old enemies."

Stephen Decatur, of Tripoli and Algiers, a captain at twenty-five; insatiable Edward Preble, who, to Decatur's report that he had captured three of the enemy's gunboats, replied: "Three, sir, where are the rest of them? Why have you not brought them all out, sir?" The devoted Richard Somers, who blew up the *Intrepid*, perishing with her rather than yield to the enemy; William Bainbridge, whose gunners of the *Constitution* made a total wreck of the *Java;* and Thomas Macdonough, who immortalized himself in the Battle of Lake Champlain and of whom Roosevelt has written that he "feared his foes not at all but his God a great deal." Let Oliver H. Perry of the Battle of Lake Erie not be forgotten: "You will have to engage the enemy to leeward," reported his sailing master, Taylor, to which the impatient Perry replied: "I don't care, to windward or to leeward, they shall fight today."

A readable book, and honest piece of work, claiming not too much for the old Navy, and generous to the foe. It should be in the hands of every young gentleman at the Naval Academy. He will find it an inspiration.
HENRY E. ARMSTRONG in the New York *Times*.

There are always difficulties about writing early American history, when brought into comparison with the larger movement of the world. The events in themselves are often petty and insignificant and have to be recognized as such. And the very insignificance of the main events exaggerates the tendency to overestimate the importance of minor details.

But Commander Frost has deeply and truly seized the two fundamental principles that can save such a history as his from the defects I have suggested and can give it larger significance as well as dramatic interest. The first of these principles is to stick to the main issues involved and to show that events, comparatively minor in themselves, are important from their permanent historical bearing.

Still more important, and what gives its chief richness and interest to Commander Frost's book, is the emphasis upon men. It is not numbers, it is not equipment, it is not even victory that makes the human interest of war, on sea or land; it is the fact that men fight it. The battles on the Lakes were not Trafalgar, but the heroism of Lawrence carries us out of ourselves like the heroism of Nelson. Above all, the vigorous, masculine, dominating figure of Paul Jones flares and glows through Commander Frost's earlier pages with a dramatic picturesquesness that would give life to any book.
GAMALIEL BRADFORD in *The Book League Monthly*.

This is an old-fashioned tale of the sea; a tale of frigates and brigs and ketches and schooners and privateers and fire ships; of cutting-out expeditions and hand-to-hand fights with cutlasses and one-shooter pistols; of perfectly stunning victories by young Americans; of triumphs over the elements of wind and storm and tide, coincidentally with triumphs over hostile men.

When one reads Frost's account of what Jones did, one feels inclined to doubt it. What Frost says Jones did seems quite impossible. How could one little man, commanding only a very few miserable, purchased vessels of ill-sorted kinds, with only half-trained officers and half-mutinous crews—how could he keep the wonderful British Navy all agog so long and finally sink H.M.S. *Serapis* in single combat? Clearly he could not. But he did!

All of Barbary Coast campaign presents a moving picture to any one of even average imagination, as stirring and colorful as any ever shown on any screen; immeasurably wider in scope, immeasurably greater in depth.

He (Frost) shows that the British activities on the Great Lakes were intended to coöperate with others at the mouth of the Mississippi.

If the British had succeeded, if Perry and Macdonough had not defeated them on the Great Lakes, and if Jackson had not then defeated them at New Orleans, the United States of America would ever since have been, and would now be, a narrow fringe of little states stretching from the vicinity of Boston to the northern end of Florida.
REAR ADMIRAL BRADLEY A. FISKE in New York *Herald-Tribune*.

To landsmen—a thrilling tale of adventure at sea; to Navy men—a readable text on the value of offensive attitude in naval warfare; to statesmen—a lesson on the advantages of a vigorous national policy; and to all Americans—a brilliant exposition of the vital necessity for a Navy and of the paramount importance of its morale, reputation, and prestige.

Written in an easy flowing, delightful style, that holds the interest of laymen and explains clearly to the technician, Commander Frost's book is a distinct contribution to naval literature.
Army and Navy Journal.

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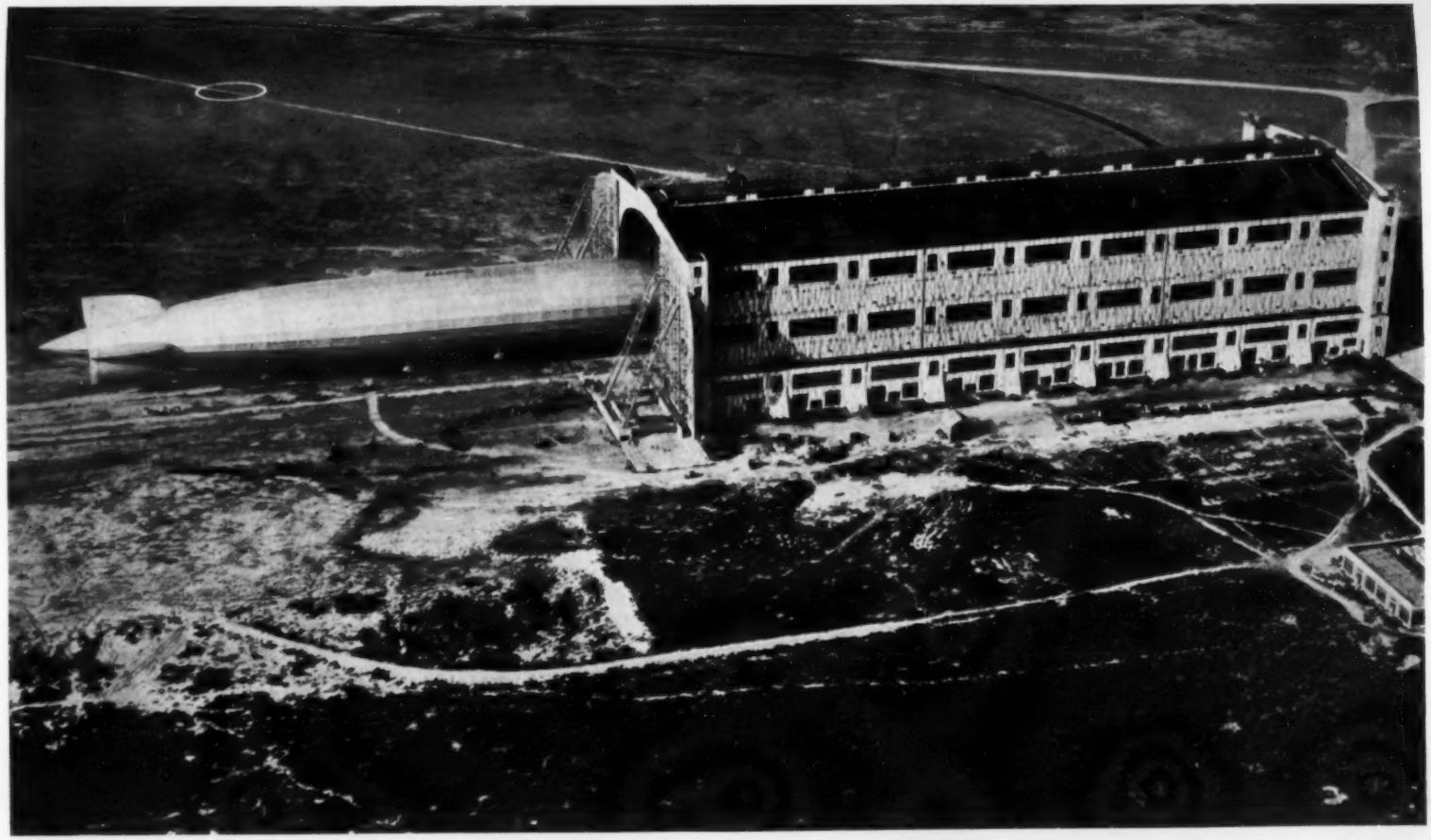
By Ewing Galloway, N.Y.

THE LOWER MANHATTAN SKY LINE FROM GOVERNOR'S ISLAND

Courtesy Walter Johnson, Chief Photographer, U. S. Navy

THE *GRAF ZEPPELIN* ARRIVING AT LAKEHURST
On completion of her 'round-the-world flight, August 4, 1929.

On completion of her 'round-the-world flight, August 4, 1929.



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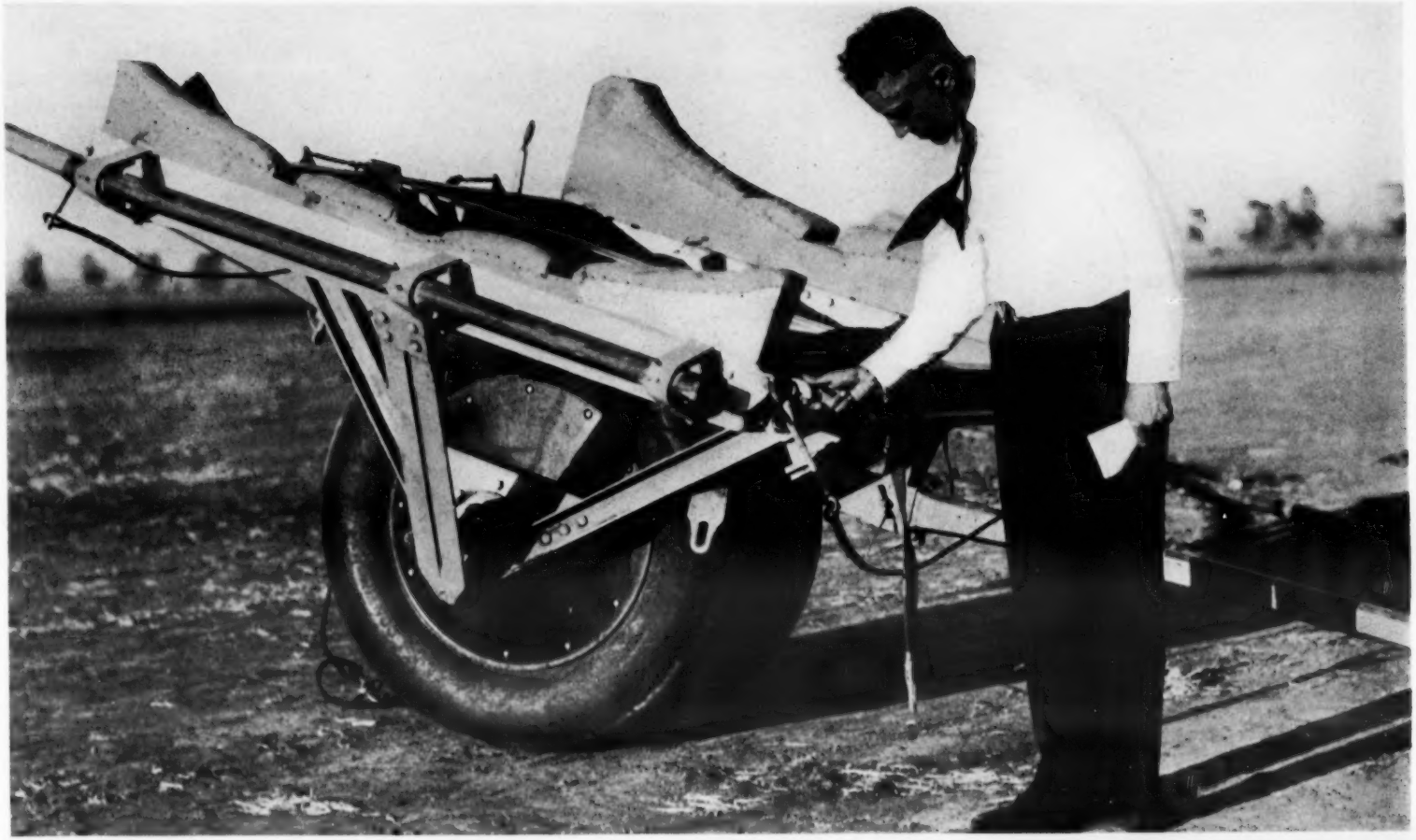
GRAF ZEPPELIN ENTERING THE HANGAR AT LAKEHURST
After her epic flight.



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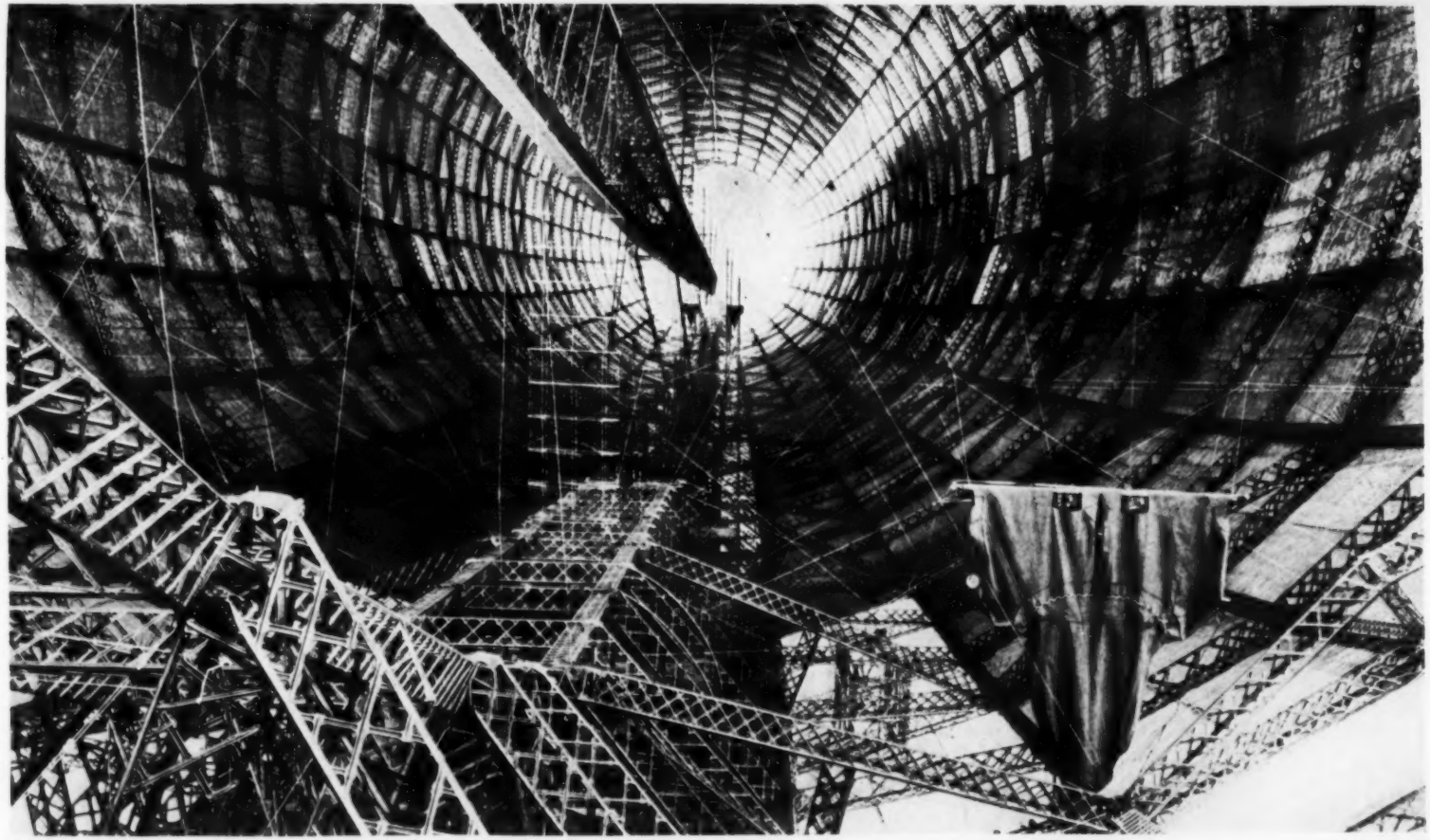
THE "DOLLY"

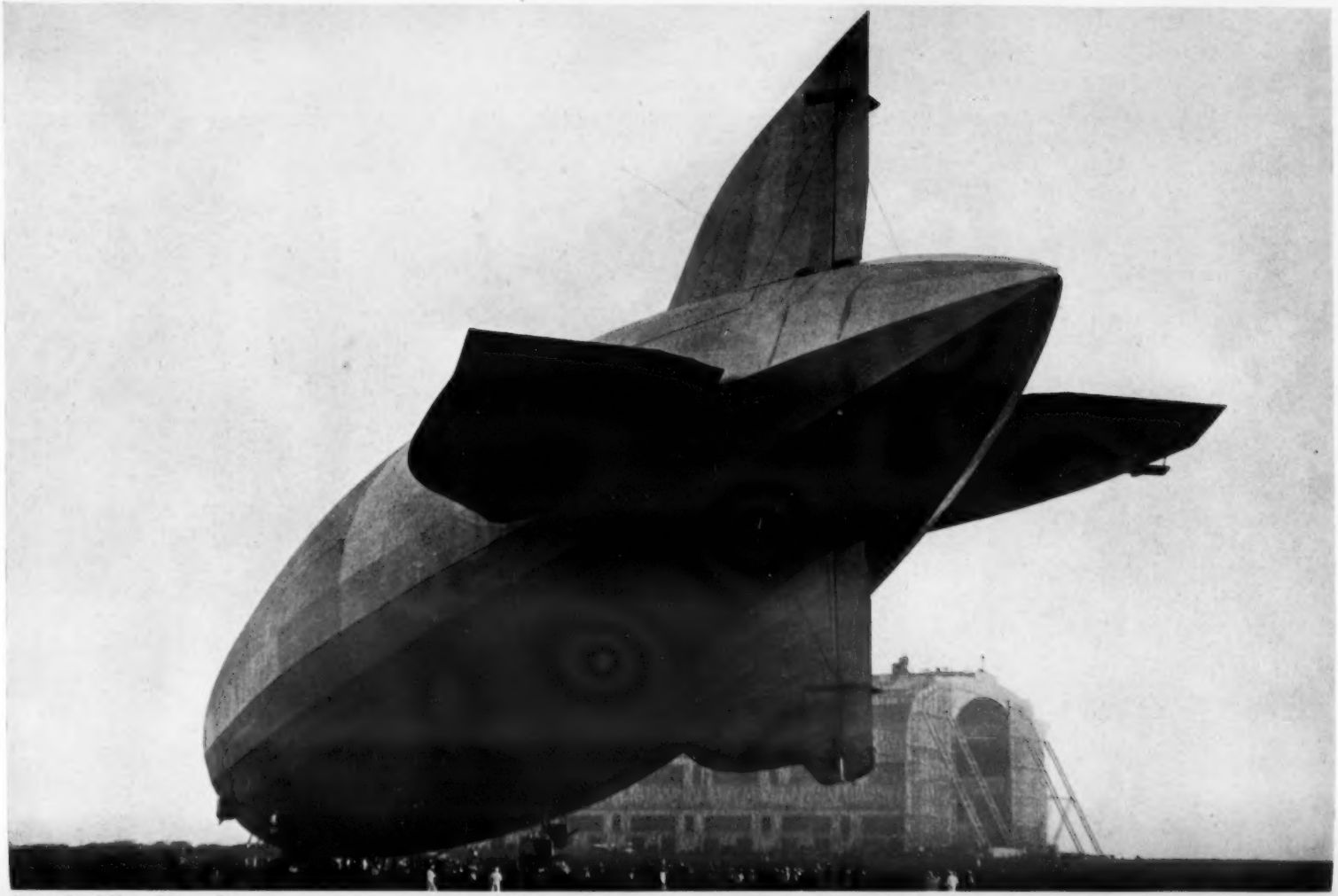
Used to support part of the *Graf Zeppelin* after she landed at Los Angeles, eighty hours after leaving Kasumigaura Flying Feld, near Tokyo.

Used to support part of the *Graf Zeppelin* after she landed at Los Angeles, eighty hours after leaving Kasumigaura Flying Feld, near Tokyo.



Courtesy Walter Johnson, Chief Photographer, U. S. Navy

INTERIOR VIEW OF THE *GRAF ZEPPELIN*
Showing the intricate metal work and stays.



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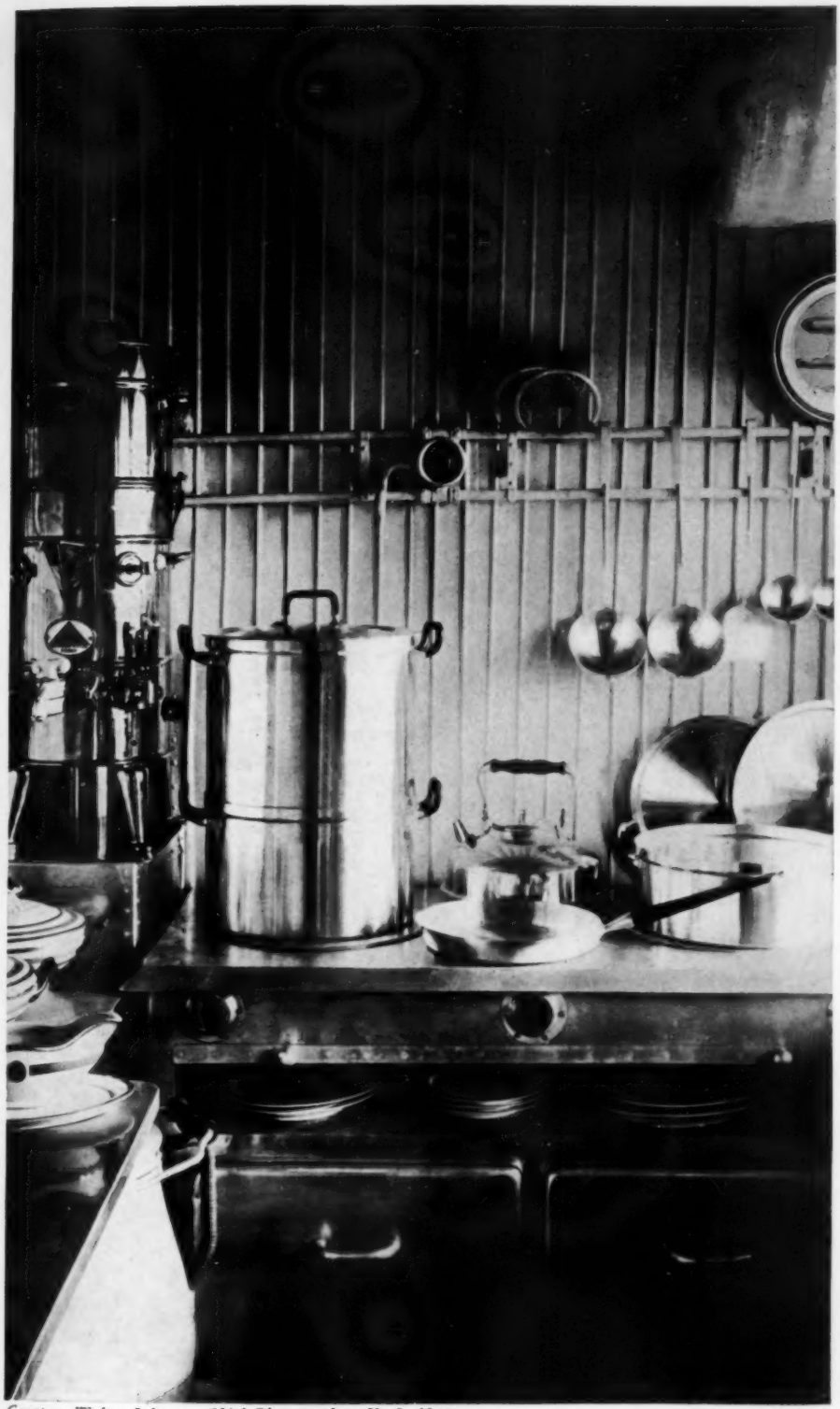
A careful inspection of the lower rudder shows where she was damaged by a power wire when she took off from Los Angeles.



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A careful inspection of the lower rudder shows where she was damaged by a power wire when she took off from Los Angeles.

Courtesy Walter Johnson, Chief Photographer, U. S. Navy

THE "GALLEY" OF AN AIR LINER
Showing the kitchen equipment of the *Graf Zeppelin.*

From a painting by William Steeple Davis *Copyrighted*

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With one beat of his wing,
Charles Lindbergh goes to Paris! 1927

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UNITED STATES
NAVAL INSTITUTE
PROCEEDINGS

Vol. No. 55, No. 11 NOVEMBER, 1929 *Whole No. 321*

Joint Overseas Operations

By MAJOR GENERAL ELI K. COLE, *U. S. Marine Corps**

Aut vincere aut mori.

IN THE event of a war in which our country is a belligerent, one of the most important duties of our naval service will be the placing on hostile territory of military forces, and as the outcome of the war may well depend upon the efficiency with which such overseas operations are carried out, it is vitally necessary that the naval service have a thorough knowledge of the methods whereby unity of command and of effort are to be secured, of the duties it will be called upon to carry out in such operations, and a thorough appreciation of the difficulties of the operations. In order that the scope of the subject may be understood, the following definition of an overseas expedition is advanced: *The movement overseas, including the embarkation at port of departure and debarkation at place of landing, under convoy and support of naval forces, of a military force having for its mission the seizure of a position on hostile territory from which further offensive operations may be undertaken.*

This definition is exact enough for the purpose, as under it there may be included operations incident to the advance overseas of our fleet, as well as operations involving a major effort, both military and naval, culminating in an invasion of enemy country.

The United States, as a result of inherited prejudices and of its long years of comparative isolation and freedom from the dangers of foreign attack, has an ingrown objection to maintaining adequate military forces. Yet we all know that the United States was founded, has been developed, and has been maintained by the force of arms. We all must realize that with our added wealth, billions upon billions of which are invested in foreign countries, we as a country are becoming more and more involved in international affairs, and that with the comparative reduction in the size of the world due to improved transportation and communications, our interests and welfare are becoming more and more dependent upon conditions beyond our borders.

The United States is opposed to war as a method of settling international friction or disputes, yet all countries have policies founded upon what they believe are vital interests, and if the history of the past reflects in any way future possibilities, even though we have renounced war as an instrument of national policy, we must be prepared for the time when opposing interests clash, when diplomatic and other means fail, and when we as a country are confronted with the possibility of war. The personnel of the armed services realize that the defensive does not win wars. Yet our policy of military and naval preparedness may, of course, make it necessary for us to assume a general defensive for the time being in order that our unpreparedness may be overcome; but even then there must be offensive strokes to raise and keep the mo-

EDITOR'S NOTE: General Cole died July 4, 1929.

rale of the country and to teach the enemy caution. In the event of a major war, there is apt to be a rapidly increasing demand for positive action against the enemy—possibly prematurely, and to an extent for which we are not properly prepared. Those leaders who control the movements of our armed forces must be prepared to withstand such demands until they can feel reasonably sure that our forces are capable of carrying out the plan or plans of action decided upon. To give way to public clamor may be disastrous and may result in a defeat that would turn an otherwise short war into a long-drawn-out and bitter contest; yet, on the other hand, if we are compelled to adopt the defensive, it must be discarded just as soon as sufficient trained forces and material are available for us to assume the offensive; and from then on, the enemy must be attacked and beaten down until our will prevails. One of the world's greatest strategists, the late Admiral Mahan, wrote:

> The assumption of a simple defensive in war is ruin. War once declared, must be waged offensively, aggressively. The enemy must not be fended off, but smitten down. . . . . Till down he must be struck incessantly and remorselessly.

The geographic location of the United States, between two oceans, is such that in the event of a major war, for us to take the full offensive will require, with two exceptions in part, overseas expeditions.

The military policy of the United States is, broadly, to maintain small regular forces, with, however, a considerably proportionate excess of commissioned officers, to be augmented first by reserves and the National Guard, and second, by the mobilization of such parts of the nation's resources as the case may call for. Amongst other requirements, the general naval policy is "to make war efficiency the object of all training and to maintain that efficiency during the entire period of peace"; "to develop and to organize the Navy for operations in any part of either ocean"; and "to maintain a Marine Corps of such strength that it will be able adequately to support the Navy . . . . by the maintenance in readiness of an expeditionary force." The major war mission of the Marine Corps is to support the fleet by supplying it with a highly trained, fully equipped expeditionary force for the minor shore operations which are necessary for the effective prosecution by the fleet of its major mission, which is to gain control of the sea and thereby open the sea lanes for the Army overseas.

If during the course of the naval campaign on the high seas the operations have to be carried on at a distance from home yards and bases, it will probably be necessary to seize and to occupy temporary bases from which the fleet can operate against the enemy fleet unhampered by a large train and to which the fighting ships can go to refuel, revictual, effect minor repairs, and, especially in the case of smaller craft such as destroyers and submarines, obtain necessary rest and recuperation for the crews. The establishment and maintenance of the shore defenses of such naval advanced bases is a war-time function of the Marine Corps, and requires that its forces be organized, equipped, and trained, ready to meet the contingency whenever it shall arise. Furthermore, the forces organized and trained for these duties must be ready to move with the fleet whenever the latter leaves its home bases for war-time service overseas.

The Navy will be ready before the Army, but as no *military* expedition will leave the shores of the United States until command of the sea has been gained by our naval forces, the naval service will have ample scope for its energy during the period concerned in searching out the enemy fleet and in establishing the necessary bases.

There is no operation in war that requires for its successful conclusion more thorough study, more careful planning, more complete preparation, more detailed staff work, and more skillful execution on the part of all concerned, than does the seizure by a military force of a beach head on a hostile coast. Joint overseas operations may be divided into four main parts:

(a) The preparation in home territory of the forces concerned, including plans of operation, mobilization, training, concentration of troops, ships, and supplies at ports of embarkation.

(b) The march overseas (in transports) including embarkation of troops and supplies in accordance with the tactical plan adopted for the landing.

(c) The debarkation, including the naval preparations therefor, the landing of the troops in tactical formation on the hostile coast, and the naval support during the landing.

(d) The securing of the beach or landing head with the subsequent advance inland up to the limits of naval support, i.e., effective gunfire.

Reasonable preparedness for possible wars includes the preparation of basic war plans, which are founded on thorough studies of the countries concerned, and which in their final form are presumed to have the approval of the chiefs of the different executive departments concerned. On this general plan for the conduct of a war are founded the basic plans of the various services and executive departments concerned, and any operating plan must conform thereto; and, in the case of operations involving both military and naval forces, must, in addition, in its final form, be in such shape that the specific tasks of, or parts assigned to, the different services are capable of execution, and that those tasks dovetail in and form an harmonious whole.

History shows that one of the most prolific causes for failure in overseas expeditions has been the inability or failure of the naval and military commanders concerned to work together harmoniously. This vital defect has been corrected or eliminated by the adoption by the War and Navy Departments of a policy governing joint action of the Army and Navy, and under this policy are prescribed two methods of coördinating the efforts of the military and naval forces in joint operations:

(1) "Under the Principle of Paramount Interest,[1] authority and responsibility for the coördination are vested in the commander of the force whose functions and requirements are, at the time, of the greater importance." Under this system (a) "The commander of the force of the service having paramount interest is authorized and required to designate the missions of the Army force and of the Navy force participating." (b) "The commander of the force of the service not having paramount interest is required to execute the mission assigned by the commander of the other service, and to subordinate the operations of his own command to those of the commander having paramount interest. In executing such mission, the commander occupying the subordinate status does not yield the actual command of his force. He shall, however, be held responsible by the next higher commander of his own service for the proper subordination of his activities to those of the commander having paramount interest."

(2) Under the Principle of Unity of Command, where "the President, under his constitutional authority as commander in chief, may delegate his authority, insofar as concerns the exercise of command over forces engaged in joint operations, by the appointment of either an Army or naval officer to exercise such command." (a) "Unity of command embraces the responsibility for, and the power to direct, operations of forces of the Army and Navy having a common mission." (b) "Where the magnitude and character of the operations warrant, a commander exercising unity of command shall have a headquarters separate and distinct from those of the commanders of the forces of the two services, and shall deal with these forces as subordinate elements of his command." (c) "Unity of command empowers the commander to coördinate the operations of the forces of both services assigned to his command, but it does not contemplate the issue by the commander of instructions as to dispositions for, or methods of operation in the accomplishment of missions assigned solely to forces of the service to which the commander does not belong."

"Each war plan shall prescribe for each phase of the campaign the method of coordination between the forces of the Army and the Navy which are to be employed. Where coördination under the Principle of Paramount Interest is directed, the plan will state which service has the paramount interest. Where Unity of Command is specified, the plan will state whether an Army officer or a Navy officer is to be designated to exercise such command." This policy enumerates five classes of joint operations, of which two pertain to this paper[2]: (a) joint overseas movements; (b) landing attacks against shore objectives. Certain paragraphs set forth the tasks of the Army and Navy forces in joint operations in part as follows:

Joint overseas movements.—"The normal Army tasks in joint overseas movements are:

"(a) To provide and operate all vessels

[1] Army-Navy Joint Action.

[2] Ibid.

for the Army except when naval opposition by the enemy is to be expected.

"(b) To assemble the Army troops together with their equipment and supplies at designated ports of embarkation.

"(c) To provide and operate the Army ports of embarkation.

"(d) To load transports provided by the Navy . . . . subject to Navy approval as to stability of vessels.

"(e) To load in readiness for operation such aircraft, or an armament that can be made available to assist the Navy during the movement at sea, or in landing operations.

"(f) To organize and operate shore installations used primarily for debarkation of Army personnel, equipment and supplies."

"The normal Navy tasks in joint overseas movements are[3]:

"(1) To maintain sea lines of communication.

"(2) When naval opposition by the enemy is to be expected:

"(a) To procure, man, equip, and operate the vessels necessary to transport Army personnel, equipment, and supplies.

"(b) To assemble the necessary transports at designated embarkation ports at the time specified by the commander of the port of embarkation.

"(c) To provide for security of transports at sea.

"(d) To provide in outlying ports means for the embarkation or debarkation of Army troops, equipment, and supplies, when such means cannot be provided or obtained by the Army."

Landing attacks against shore objectives.[4]—"The normal Army tasks in land attacks initiated on the sea and directed against shore objectives are:

"(a) The deployment into boats used for landing and operated by the Navy.

"(b) The delivery of rifle and machine-gun fire from landing boats except from such machine guns as are parts of the naval equipment of the boats.

"(c) The deployment from the landing boats and the gaining of a foothold on shore.

"(d) The organization of a defensive beach head.

"(e) The organization and conduct of operations to extend the beach head.

"(f) The conduct of operations beyond the beach head for the accomplishment of the mission."

"The normal Navy tasks in joint attacks initiated on the sea and directed against shore objectives are[5]:

"(1) Naval forces:

"(a) To provide adequate reconnaissance.

"(b) To provide the defense against enemy naval forces during landing operations.

"(c) To provide, man, equip, and operate the small craft required for landing operations.

"(d) To cover the landing by mine sweeping, gunfire, aircraft and screening operations.

"(e) To provide signal communications between ships and shore.

"(f) To organize and operate the necessary sea lines of communications for forces on shore."

"(2) Marine forces.

"Marines organized as landing forces perform the same functions as above stated for the Army, and, because of their constant association with Navy units, will be given special preparation in the conduct of landing operations."

These extracts have been quoted at length as it is believed that the presentation in broad outline of the various tasks the different services have to perform in overseas operations, will bring forcefully to attention the thousands of details involved in preparation, the necessity that these details be so worked out as to result in an harmonious plan, and the system whereby unity of direction for the various forces involved is to be secured.

The preparation of all war plans is based on an estimate of the situation, which involves exhaustive and varied studies of enemy resources. A comparison of enemy resources with our own will indicate what we can reasonably hope to do, and we select from the things that we believe we can do those operations that appear advantageous for us to carry out, due attention being given to the possibilities that enemy initiative may cause our plans to be modified.

[3] Army-Navy Joint Action.
[4] Ibid.
[5] Ibid.

These previous studies will have indicated the general localities where such landings may be attempted with reasonable prospects of success and where the establishment of our military forces on shore will enable the further operations planned to be carried out. It will probably be quite as apparent to the enemy as to ourselves that certain localities present favorable conditions for hostile landing operations, so we must expect that our landings will be prepared for and opposed. We must also expect that the preparations for and the departure of a large overseas expedition will be known by the enemy and that additional defenses will be installed and additional precautions taken prior to the possible date of arrival off the enemy territory. However, there are apt to be more localities than one where advantageous landings may be made and far enough apart to prevent a common defense, so that the attackers, if their movements are properly screened, have the advantage of knowing where the landing is to be made and so may hope to have only part of the enemy's forces to overcome at the outset. Calculations must be made as to the length of time required for enemy concentrations, to make sure that we can establish ourselves in such advanced positions as will enable our forces to take up a systematic offensive immediately upon reorganization and the completion of the landing, or will enable them to cover the base until such time as our following forces bring our strength to the point where the offensive can be taken up. However, the expedition should be of sufficient strength at the start to carry out its mission, though that mission may be limited.

One thing that should be brought out is the absolute dependence of our overseas expeditions upon sea power. The fundamental factors of sea power have been set forth by the Chief of Naval Operations as follows:

"(1) Naval strength sufficient to insure free movement of national seagoing trade. (This implies a sufficient force to search out and destroy, or bottle up and immunize, the main hostile naval forces and at the same time to safeguard our own overseas communications.)

"(2) A merchant marine of sufficient size and suitable characteristics to carry the nation's products . . . . and, in time of war, to carry on essential war-time trade and to furnish auxiliaries and transportation for naval and army forces.

"(3) A sufficient number of well-located and sufficiently equipped and defended bases throughout the world, to afford support and protection to commerce, and operating bases for the fleet."

The distance a maritime force can advance overseas is limited, unless secure naval bases have been established along the route of advance, and it may be taken for granted that no overseas expedition for operations other than the seizure of bases in connection with the advance of the fleet will be undertaken until our naval forces have gained control of the sea. The securing of such bases is ordinarily the province of the naval service (Navy and Marine Corps), and as these bases when needed must be secured prior to embarkation of an overseas expeditionary force in its home ports, the absolute need to the naval service of an adequate and properly organized and trained Marine Corps becomes apparent. The subsequent holding of these advanced bases becomes a function of the Army, relieving the marine forces for further operations with the fleet.

An overseas expedition having been included in the basic war plans, adequate preparedness dictates that all available information concerning the operation be gathered in time of peace by the respective services concerned. On studies of the information so gathered are based the location selected for the landing, the size and composition of the military and naval forces required, including all auxiliaries, ports of embarkation, etc. The naval and military commanders will look at the problem of landing from different viewpoints. For the military forces the real problem, from their point of view, will begin after the landing, while the Navy will naturally look to the approach to the landing place and the actual putting ashore of the military forces as their real problems. However, there is one point that is of vital importance to the success of the expedition, and that is the ability of the Navy to keep open the sea lines of communications after the landing, thus assuring an uninterrupted service of supply.

The military commander will want the landing made in a locality that is not within

an area dominated by permanent fortifications, and that if defended, it will be by temporary fortifications or defenses only—in other words, an improvised defense. The landing place selected should have a broad front, in order that failure in one part of the landing will not be final, but may be counterbalanced by success in another part; it should have no impassable obstacles running back from the beach a sufficient distance to cause the attackers to be beaten in detail before the two parts can be united; it should be of sufficient depth to enable the attackers to establish themselves sufficiently far from the beach to enable them to cover from the fire of all weapons except airplanes the landing of following troops and supplies; it should have roads leading towards the enemy forces and not dominated by extensive natural obstacles; it should be in such a position that once occupied by the attacking troops, it becomes a real threat to the defending forces.

The commander of the attacking troops will desire a number of points where landing is possible, sufficiently far apart to require a separate defense, the occupation of any one of which will enable the attacker to advance to carry out his mission. The localities having these advantages will be few. Some localities will have some of the requirements; they must be compared and the mutual advantages and disadvantages weighed. Eventually a number of localities may be selected as points where the landings have a reasonable chance of success. It will be remembered, however, that a landing in face of a determined enemy, in adequate numbers, in carefully prepared positions, has little chance of success; also, no matter how easy the gaining of a foothold on some particular part of the enemy territory may be, if the resulting position does not give a reasonable chance of successfully carrying out the mission of the force, it is of no use. The localities where the landings may be made with reasonable chances of success from the military point of view will be designated in the order of desirability and referred to the naval authorities for their investigation of the feasibility of the landing from the naval point of view.

The naval authorities will be more interested in the nature of the approaches to the possible landing places, in their ability to land the troops in an orderly manner, and in the ability of the naval forces to maintain the line of supply. The Navy should in time of peace therefore gather as complete information as possible concerning approaches to selected landing places and the landing places themselves, including terrain inward of the landing places up to the limits of naval supporting gunfire. In detail this information should cover at least the following points:

(a) Nature of approaches to selected landing places, i.e., is there adequate maneuvering space so that ships may approach unloading area on a wide front, or is there a restricted maneuvering space, and particularly one where ships or divisions will or may be subjected to flank attacks during entrance, and if the latter, nature of attacks to be expected—gunfire, submarines, air forces, and means of combating them. The location of probable enemy mine fields should be determined and mine-sweeping arranged for.

(b) Nature of anchorages: depth of water, character of bottom; distance from selected landing points that transports will have to anchor or lie to while transferring troops and material from transports to small craft for landing; protection from wind and sea; character of reefs and effect on landing troops and supplies; would boats have to approach in column or on a narrow front, and if so, is there room for deployment on a broad front between reefs and landing places? Are distances from such passages through reefs to positions on shore such as would enable defenders to deliver effective fire? Are the entrances through reefs wide enough and sufficiently well marked (by breakers, for instance), to enable large numbers of small craft to approach and enter at night?

(c) Weather conditions: prevailing winds, seasonal and diurnal; state of sea; areas near selected landing places where shelter against wind and sea may be expected; probability of unusual weather conditions and effect on landing operations, such as prevail during typhoon conditions in the Philippines or during the "Norther" season in the Gulf of Mexico; rise and fall of the tide with its effect on underwater approach to high-water level of selected landing places and on control of ships at anchor or lying to and discharging troops and material; sunset table;

table giving "moon rise" and effects of prevailing weather on light conditions.

(d) Landing places: nature of beaches —sand, rock, rock and sand, etc.; whether shelving or gradual; indentations, such as rivers or marshes; sand spits or promontories; division of landing places into "beaches," i.e., where separate organizations may land; method of establishing and of maintaining signal communications between troops ashore and command afloat.

(e) From high water mark to limits supporting naval gunfire: nature of terrain with particular reference to defensive positions, including known and suspected defenses; lines of enemy approach; probable enemy concentration points, lines of communication leading from beach to interior.

The naval authorities from their investigations and studies of the approaches to landing places designated by the Army would decide in what localities the landings were feasible and report to the military authorities the result of their studies. When these studies are completed the military and naval commanders should decide on the actual place or places where the landings will be made. In this connection the attacking forces must be well prepared to overcome an all-around defense from (a) *undersea,* such as submarines, mines, wire and other obstructions, supplementing natural obstacles, etc; (b) *surface,* such as gunfire, at long and short ranges, making it necessary that troops transfer from transports to small craft at long distances from shore, machine-gun fire from prepared and hidden positions, gas (lachrymose, at least), wire and other obstacles, land mines, etc.; (c) *air,* such as bombing, machine-gun fire, flares to light up the targets, etc. It is also desirable that, if possible, there should be more than one locality where the landing of the attacking forces would enable them to carry out their mission—the more possible advantageous landing places the better—and these possible landing areas should be far enough apart to make it impossible for defenders' troops to be concentrated between time when place of actual landing became apparent and time when beach or landing head can be secured. In this connection the value of feints and secondary landings to befog the defending forces as to actual area of main attack becomes apparent.

The next step would be studies by the military authorities of the localities selected and of the operations that are to be carried out after the landing in order to arrive at a decision as to the actual composition, equipment, and the necessary supplies of the force necessary for the accomplishment of the mission or task. Provision should also be made in addition to the force itself for a large number of replacements to be immediately available after the landing, as under the best of circumstances the losses of the attacking force are apt to be heavy. This data having been arrived at, the naval authorities will be informed thereof, and it then becomes necessary to make study of the shipping that may be counted on as available in order to be prepared to assemble the necessary numbers of transports and supply ships for the military as well as for the naval forces of the expedition.

There is one point in particular that should be noted, and that is, that all the various orders and annexes, loading of ships, embarkation of troops, provision of boats for landing of troops, formation of waves or echelons of boats in landing, naval supporting gunfire, naval air support, naval communications between shore and ship, naval beach parties, etc., are based upon the sequence and relative positions in which the commanding general of the military forces desires his troops to be landed, with the positions they are to take up subsequent to the first landing, and while troops and supplies are being landed. This means that the problem must largely be worked backwards, as the plans must be worked out so that the forces concerned have every opportunity of landing in tactical order, with guns, ammunition, supplies, etc., as needed, and of gaining their various objectives in the minimum of time. This in turn means that in loading transports, material required by the forces on the transports for at least forty-eight hours after the landing must be with the troops, and that articles must be loaded generally in inverse order of requirements, i.e., last in, first out. Unloading is generally in the following order: first, troops and weapons; second, water; third, ammunition carried by organization trains; fourth, organization trains.

One of the most illuminating examples of the disastrous results following the ignoring of the principles that plans should be prepared beforehand and that transports and supply ships must be loaded in exact accordance with the proposed tactical employment of the troops, was the first expedition for the seizure of the Gallipoli Peninsula. The commanding general was designated a few hours before he was to sail; he had a decidedly inadequate and untrained staff; he had no plan of operations, although general plans were in the files of the War Office; he had nothing to do with the loading of the transports, their orders being to load for foreign expeditionary service, and each transport was loaded as was seen fit. The result was that the transports had, after their arrival off Gallipoli, to be sent to Egypt to unload and there reload in accordance with the tactical situation as seen by General Hamilton after a reconnaissance from the deck of a battleship, thus losing the value of a surprise attack, and giving the defenders some weeks in which to strengthen their defenses. In an overseas expedition surprise is of the very greatest importance, for a forced landing against prepared and strongly defended positions is going to be a well-nigh hopeless, if not an impossible task.

The naval authorities must make their estimate as to the necessary naval forces to provide for the security of the expedition throughout its entire movement overseas, during and after the landing, and provide the necessary force therefor. They must also be prepared to furnish the destroyers, tenders, tugs, special boats, and small boats for the actual landing of the expeditionary force in the tactical order desired by the military commander, without delay, in accordance with the schedule of landing of waves of troops made up by the military and naval commanders, bearing in mind the fact that many small boats are apt to be destroyed or damaged in the landing. They must also provide the necessary boat equipment for the special and small boats. In connection with the landing, the various beach masters and beach parties, and communication officers and parties should be on the same ships as the highest ranking commander of the troops landing on the particular beach, and the naval officers in charge of the small boats used for landing should be on the same ships as the organizations they are to land. The manner of landing troops must be worked out for each beach: methods of landing will be determined by depths of water up to high-water mark, nature of beaches, conditions of sea, types of boats used, etc. The landing for the main attack should be on a broad front: (a) to take advantage of all openings and channels leading to beaches, and to prevent a massing of our troops at the best beaches, which will in all probability be the most thoroughly defended; (b) to favor enveloping movements by locating the weak points in the enemy defense, and through operations against these weak points, to be in position to outflank enemy strong points; (c) to diminish the power of the defense at one point to assist in the defense of another.

The landings may be made in one of two ways: first, to land as many tactical units in one wave as the limitation of small water transportation permits; second, to land tactical units in their proper order for battle, utilizing as many tows or trips as are necessary. Plan No. 2 is believed decidedly the more advantageous in that tactical units will reach the beaches in the order of their intended employment. The first wave will have time in which to maneuver to secure a shallow beach head before the arrival of the second wave, and the first two waves should together be able to deepen the beach heads and to clear the immediate vicinity of the beaches for the landing of succeeding waves. Confusion and losses will be reduced. Control and command will be better preserved.

Another point which does not concern the Navy except in a general way: the forces landing at each beach must be assigned definite tasks covering the following points: (a) extent of beach to be cleared; (b) depth of beach head and object; (c) establishing communications with troops landed at adjacent beaches. Another point that the Gallipoli Campaign brings out is the absolute necessity that the objectives assigned to various troops be known and that the leaders be informed of the parts they have to play in the operation. In the landing at Suvla Bay, the objectives were left in doubt and no officer below the grade of division commander was informed of the part his organization was

expected to play after reaching the beach. The results were that troops wandered around or remained on or near the landing beaches, that none of the real objectives were taken, that the enemy was given time to bring up large reënforcements to vital but practically undefended localities, with the final result that an operation that had great chances of decisive success was a dead failure.

The naval and military authorities will both be concerned in drawing up the schedule for the landing of troops in small boats. The military authorities will desire that the troops are landed in the order specified in tactical units (i.e., sections, platoons, companies, etc.) as rapidly as possible in order that the full weight of the landing blow may be felt by the enemy as soon as possible. The Navy will desire the same thing, but will have to decide on how the boats are distributed to the troops, the method of landing the third or fourth and subsequent waves, whether they shall be transferred from transports to destroyers, tenders, etc., and again transferred to small boats, and in both cases how far transports may approach the shore before beginning the transshipment of men and material. The whole operation from the time transports begin unloading until the troops are on shore is of such vital importance as to warrant the most careful planning of the details of landing. The schedule should be prepared before the expedition leaves the United States and the various organizations of the force should be specially trained: (a) in the loading of and entering in the type of boats to be used for landing purposes, such instruction to be given first in smooth waters, and second, if practicable, under conditions approaching those that will probably prevail off the places of landing, and third, at night, as the seizure of even only lightly defended beaches by day will probably be found very costly, if not impossible; (b) in debarking on the beach from small boats, in the immediate advance back from the beach, in quick reorganization of units—first by day and later by night, etc.

The Navy is charged with "covering the landing by mine sweeping, gunfire, aircraft and screening operations."[6] The first and the last requirements are purely naval operations, but the second and the third requirements must be performed in close cooperation with the landing forces and consequently must be determined after consideration by both the naval and military commands. In this connection the Army is charged with the requirement "to load in readiness for operation such aircraft, or an armament that can be made available to assist the Navy during the movement at sea, or in landing operations."[7] Generally the Army aircraft will have to be shipped "knocked down," so if they are employed before the actual landing it will be through the possibility of the seizure of an air base a sufficient length of time (ordinarily set at twenty-four hours) prior to the main landing of troops. This would enable some at least of our military air units to be landed, assembled, and take the air in time to assist in the actual landing. This cannot be depended upon, however, and it will be necessary for the Navy to supply an air force capable of gaining control of the air, or at least preventing the enemy from maintaining air supremacy during the period between approach of ships to vicinity of points selected for landings and time when landings have progressed to point where our military air forces can be landed and begin to function. Needless to say, the independent air base should not be located so as to indicate to enemy point of main attack, nor should it be occupied a sufficient length of time in advance of the proposed landing to enable additional serious defenses to be installed by the defenders. During the period when the Navy is furnishing the air forces the military commander must furnish skilled observers in order that the type of information desired may be secured and non-essentials eliminated. The naval air force must be outfitted to take aërial photographs, to lay smoke screens or curtains, to use machine-gun fire and fragmentation bombs against land defenses, to maintain fire control for naval guns against land positions, to observe and report, and to attack enemy planes. The Marine Corps dual-purpose or amphibian plane is particularly valuable for this preliminary work in that if a sheltered spot for the transports carrying the Marine Corps planes can be found, the planes can be assembled on the deck of the transports carrying them, lifted

[6] Army-Navy Joint Action.

[7] Ibid.

over the side fully equipped, and take off from the surface of the water.

The requirement that the Navy support the landing by gunfire is one of the most difficult features of the operation as naval guns are generally not fitted for landing operations in that their trajectory is extremely flat and consequently there are many large areas from which fire can be delivered by the defense without being the object of fire in return. The Navy is used to firing at visible targets—visible either from the ship or from the air with communication to the ship—while in land warfare the object of fire is almost always invisible, though once its location is determined, it can be destroyed or its fire neutralized, provided there is fire to do it. The difficulty in covering landing operations is heightened by the fire having to be delivered in part at least at night with the attendant disadvantages, owing to the darkness, of lack of knowledge of the actual position of the ship, lack of knowledge of the actual position of the targets, and inability to tell whether or not the fire is actually effective.

The military commander (or his chief of artillery) will make a study of the terrain involved. He will put himself in the enemy's place and will come to certain conclusions as to the enemy's dispositions to meet and to overcome a possible landing at the area in question. Certain positions will be clearly indicated as points where strong defenses will be installed; others where secondary defenses will exist; here there will be machine-gun nests to cover approaches to the beach, and there strong points to repel the attack as it advances from the beach; here there will be reserves and their lines of approach; along the beach, at certain places at least, will be under-water obstacles, such as wire, mines, etc.—in fact, he will draw up a complete plan of the enemy's defense measures as he conceives them to exist in the minds of the defenders. He will also take into consideration the actual features of his own attack and in preparing his plan for the landing he will do what he can to minimize the defense's plan and will again consider where are the probable defenses capable of doing the most damage to the attacking force. These problematical defenses will be shown on a large-scale map to enable the "grid" system of locating targets to be employed. The map or its sections should be of sufficient size to cover the entire coast line affected by the landing and as far inland as the limits of naval gunfire. In its final form it will be used not only to indicate the places to be subjected to fire during the landing itself, but also as a means of locating points where special fire is desired. Having carefully considered the known and probable locations of enemy defenses, the military commander must consider how these defenses can be overcome or neutralized and he will eventually draw up tables of fire which contain his estimate of the expenditure of ammunition necessary to enable him to accomplish his mission. The military commander's estimate will go to the naval commander for his study of the problem, and he in turn must decide whether it is practicable to furnish the actual number of guns and ammunition to carry out the schedule considered necessary by the military commander. Ammunition with reduced charges will be of great value for indirect fire, thus enabling naval gunfire to search out the reverse slope to some degree, at least. The amount and kind of ammunition ordinarily carried by a naval vessel is entirely inadequate for the fire required in supporting a landing, and special estimates will have to be made in regard to these. The actual value of naval gunfire in support of a landing is the subject of much discussion and the conditions under which it would be used make it quite a difficult problem to solve satisfactorily, yet it has to be solved if an overseas expedition expects to land successfully on an enemy coast in the face of even improvised defenses. However, the Navy has solved tough problems in the past, and there is no reason why the problem of naval gunfire in support of a landing should not eventually be solved. It will probably be a problem for discussion between the two commanders—or their technical staffs—and eventually, in its final form, the naval gunfire provided will be a compromise between the two services. While the artillery of the expeditionary force should be landed as soon as possible, no dependence whatsoever can be placed on having any guns larger than the 75's on shore within forty-eight hours after the landing starts or even longer. During this period the Navy will have to be depended upon for supporting fire of our troops on shore when the fire from

larger guns than small howitzers and 75 mm. is required.

There are literally hundreds of points in the preparation of final orders for the landing of an expeditionary force on a hostile shore which must be the subject of discussion between the military and naval commander (or their staffs) before being incorporated in the final orders, and the following method of developing operating plans and orders is suggested as meeting the necessities of the case:

(1) The executive department would decide whether the Principle of Paramount Interest or the Principle of Unity of Command would prevail.

(2) The naval and military commanders charged with the preparation of the plans would be designated.

(3) The war plans would be furnished to these commanders.

(4) The commander of the whole, or in a case where the paramount interest governs, the commander having the paramount interest, would prepare his estimate of the situation, decide what the mission would be and set forth his general plans for the accomplishment of this mission.

(5) These papers would be referred to the other commander or commanders for their study and for their comments thereon.

(6) These studies having been completed, the separate estimates of the situation as affecting the naval and military forces, with such comments or suggestions as the respective commanders deemed necessary, would be returned to the officer in supreme command.

(7) During the previous studies there will probably have arisen numerous points which will require further consideration by the officer in supreme command, and from his study of these papers, that officer would amend his plans as deemed necessary by him, and these amended plans would be returned to the other commanders either for the preparation of their detailed plans or for further study.

(8) The various differences having been reconciled, the final steps would be the preparation of the plans and orders of the officer in supreme command and, these completed, they would be followed by the final preparation of plans and orders by the subordinate commanders.

Throughout the various steps mentioned above, the commanders concerned would keep their staffs occupied in gathering, digesting, and tabulating information so that in the end there is a complete setting-forth of the plan and of the orders. The plans and orders once prepared, specified officers should be charged with the continuous gathering of information, and when any information is received which indicates that a change in plan or in orders is desirable, the conditions making such change advisable should be brought to the attention of the higher commander in order that necessary steps may be taken to revise the plans to fit in with the new situation. It should be thoroughly appreciated that all the orders must be worked out and in the hands of the leaders concerned prior to the time of their departure from the United States.

The shipping involved in moving an expeditionary force overseas will be very large, causing the withdrawal of large numbers of commercial carriers from trade routes, with consequent interference with the country's commerce for an indefinite period; the expense involved in raising, training, and equipping a military force of the size needed for an overseas expedition will be enormous; the time needed for the training of the troops, if they are to have a reasonable chance of success, will be long; yet with all these eggs placed in one basket, the question as to whether the outcome shall be a success or involve an enormous disaster will depend very largely on the outcome of the plans covering the few hours of intense activity devoted to the landing. If the Navy's plan of landing, including naval supporting gunfire and air support, is based on sound premises, if the small craft provided for the landing of troops and stores are of the types fitted for the operation in question and in sufficient numbers, if all the details are thoroughly worked out, if the officers and men in charge of landing are thoroughly instructed, and if the Army troops have received the proper instruction, our side will then have done everything possible to secure the desired foothold on the hostile coast. And yet the decision will be in the lap of the gods!

Both Sides *of the* Picture

By LIEUTENANT COMMANDER J. OGDEN HOFFMAN, *U. S. Navy (Retired)*

WITHOUT the slightest inclination towards autobiography, it is my belief that something in the nature of a personal preface is due the readers of this article—not in the nature of an apology for its title and its authorship, but, rather, in substantiation of the claim of authority concerning the statements made, based on actual experience and not on hearsay.

I was in the Navy on active service from 1906 to 1923, when I resigned. I was reappointed and placed on the retired list for disability on active service in line of duty in 1927. I have had seventeen years of active service from midshipman to lieutenant commander, and approximately six years during which I have been a distributor in my own right for three automobiles for three states, served on the faculty of a large military academy, sold automobiles as an ordinary salesman, sold much real estate at retail, and have the controlling interest in a real estate syndicate.

Of the above varied employment, I am proud of my naval service only. As for the rest, it was all in the day's work and I hold no brief for it—except as experience that makes it possible for me to know what I am talking about. Many officers resigned from the Navy before I did and, doubtless, many more will resign in days to come. Perhaps those whom I place in the future may, at least, have food for thought in a view "through the looking glass"—a fascinating pastime for Alice in Wonderland and all her brothers. To the best of my knowledge, those who have resigned in the past have kept their experiences to themselves; at least, I have never seen any of them in print. I know that it would have helped me to have had a few cold facts before me, when I followed my "look" in 1923 by a crash through the glass, and if this article helps anyone imbued with the state of mind that I possessed at that time, I shall be amply repaid.

In the first place, in the mental battle of The Navy versus Civil Life, neither side knows anything really definite about the other and, accordingly, neither is in a position to criticize the other's actions. The World War broadened the civilian horizon but, even then, the whole picture was made all out of drawing by the extraordinary measures that were necessary, the rapid and unnatural expansion that resulted and the smattering of Navy life that the civilian, still a civilian, took home with him when he was demobilized. However, it taught him a little, whereas the regular Navy man, plugging away under forced draft, came out of the struggle richer by intensive concentration and rapid promotion, but knowing no more about civil life than he did before. Let us investigate why all this is the case; and in doing so I speak in the first person, advisedly, and a Navy man until I die.

If we start our naval career at the Naval Academy, the seeds of discipline find more plastic soil, in our youthful and impressionistic state, than if they are forced to germinate in an adult consciousness. In either case, we have driven into us that truth and honor are more than mere figures of speech. The obedience that is exacted of us leads us to require a like performance of duty in others.

We make mistakes, but they are reduced to a minimum by the regulations laid down by higher authority—that truly wonderful Blue Book that has the answer to almost any question, in a conveniently numbered and indexed paragraph. If we carry out its instructions, we cannot go far afield, although we learn that initiative leads to promotion and higher responsibility, when it is coupled with loyalty.

As products of a system designed with much care and perfected at tremendous expense, we become trained for the activities of our profession and for that object only. We become narrow-minded to the highest degree,

as viewed by the civilian but, in its least dimension, this mind is several times as broad as that possessed by the average plodder along the civil road. It is a different kind of mind, that is all, and it is perfectly right and just that it is so, as, after all, the government spends its money—held in trust for enfranchised Americans—to make us naval officers and not anything else. We are shielded from the troubles that encompass the civilian world and we know nothing about them, except by hearsay. The advent of prosperity or panic affects us only in the varied purchasing power of our government-issued dollars in civilian markets.

Some of us are more ambitious than others, but our status as individuals is fixed by law and our statutory rights protect us from the exercise of personal whim or preference. Every day of every year we know exactly where we stand, and we can figure it out for the rest of our expectancy of life. The moving finger writes every page of our official records, and there is no shadow of uncertainty regarding the result of overlooking our obligations—definitely stated in black and white. Our pay accrues on the books with the regularity of routine and, although it may not satisfy our wants, it is just as sure as the rising and setting of the sun.

Preparations for national or local emergency, keeping in readiness for the exercise of our military functions, and striving for increased efficiency, keep us so busy that we have little time to exchange opinions and views with our fellow countrymen. It is not that we are smugly self-satisfied or snobbish but, rather, that we live in a world of our own and rarely reach below the surface of the body politic more than is necessary to comply with the social amenities and keep within the limits of good taste.

In our immediate family problems we forge the nearest approach to a link with civil life, and draw comparisons between the exigencies of the service and the apparent security of the civilian fireside. The only permanent home that we know is the service itself, which means that every two years—three at the most—wives and families take up their pilgrimage, or else look forward to a corresponding period of separation. The house is sold, rented, or vacated; furniture is stored or crated for shipment and the children shift to another school or are deprived of further consecutive education.

The naval officer, as a specimen of the human race, shares all of the emotions common to the rest of mankind but with the necessity of keeping them under a higher degree of restraint. He retains the right to his own soul, but it is governed by a mind trained from beginning to end in the intricacies of his calling. In being assigned one duty after another he may be invited to use his own best means toward the desired end, but his subconscious mind will dictate the path trod by others, and worn smooth by the machinery of the regulations governing his conduct and procedure.

As years of service strengthen and fortify the walls of experience upon the foundations of tradition he learns that, after all, the book of regulations is nothing more nor less than the answers to the multitude of questions that have been raised in the past, reduced to the printed word for the sake of uniformity.

New tools are placed in his hands, but they are used with the age-old principles of honor and *esprit de corps* that have stamped him with the distinction of his class. He responds to the call of duty without question and gives his advice only when it is asked. Treading in the footsteps of others, his metal takes a finer and finer temper, until the age for retirement halts him at the peak of accomplishment unless the call of emergency promotes his further usefulness.

While the professional side of his nature receives development, the personal self may or may not be keeping step to produce the embodiment of order and harmony that leads to contentment. Living in a world of changes, he may have the apprehension that his own particular star is losing ground with relation to the rest of the planets. He can see his own future to the end of the trail, and the very certainty of it may make it lose enticement as compared with the gloriously indefinite prizes offered to the winners of other contests. He knows down to the last revolution how fast and how far his naval machinery will carry him, and at least once in his career he yearns to enter it in some other race.

If these thoughts do not enter his mind, he will achieve a philosophy that will take him to a port of contentment early in his naval career, and keep him there until he gets orders to proceed to his last berth. If, however, the contest between his two selves reaches the stage of a pitched battle, a combined ego must assert itself and clear for ac-

tion, making the ensuing engagement so decisive as to preclude further warfare.

So we may assume that we know all about the service, for better or worse, its good points as well as its bad. We know it to be an honorable career, a man's life, lived among men, with its moments of glory and its periods of depression, its companionship and its separations. We all draw our pay, which never seems enough and some of us visualize that distant, green pasture that always seems more attractive than the fields on this side of the fence. Someone we know made a fortune on Wall Street, somebody else is drawing a fabulous salary from a nationally known corporation—and so we turn the matter over and over in our minds "far into the night."

I thought of all these things, back in 1923, and lay claim to only one exhibition of nerve, in or out of the service, and that is the placing of my name on the dotted line of a resignation, and seeing it through to the end. The way I look at my Navy pay of that day, figured in the view of my present experience, is that it amounted to the interest on one hundred thousand dollars' worth of good bonds —more than ninety-seven out of every hundred of the human race can lay by, in an ordinary lifetime.

In the first line of endeavor that I selected, I was told that capital was what counted, and that I had more than enough to "make the grade," being supposedly endowed with the average amount of brains. No charts corrected up to date, no book of regulations to guide me, everything up to me in the management and ownership of a business that would be valuable or worthless, in just so far as I would be able to keep up with the march of progress. Remember that I did not go to work for anyone else, but relied on my own self-sufficiency to see me through, handling first-class products in the most competitive business in the world. I am still alive to tell the tale, but I paid and paid handsomely for every grain of experience, and it is just barely possible that my combined training to date may be adequate for the future, but the following are a few of the rules that I found to govern the game of life, as it was taught to me—at my expense:

(1) Use the Golden Rule if it can be applied to the case in point. If it does not fit the issue, it must be amended as may be necessary, or as conscience may direct.

(2) There is no school for the acquisition of experience, which must be bought by the individual. The price may be reduced to a reasonable figure only by learning in establishments that are maintained by the money and experience of others.

(3) The gold standard forms the basis of measurement, and title passes only upon the payment of the sales' price in full. The buyer gets just exactly what he pays for.

(4) All corporations are operated primarily and solely for the benefit of the stockholders, their friends, and those to whom they are under obligations.

(5) The facts contained in verbal or written statements become legal tender only when accompanied by affidavits bearing notarial seals. A man's word is not as good as his bond.

(6) Intentions are interesting, habits of life are important, and training in another field valuable to the individual, but justification for the extension of credit is demonstrated best by a current balance sheet, accompanied by a check, certified by a depository for public funds, in good standing.

(7) The prize is awarded to him who can adapt himself to a constantly changing environment and is bound by neither tradition nor inclination. His mind must be flexible, so as to anticipate the wants and possible actions of others, and he must defend himself by maintaining a constant offensive.

(8) The doctrine of the business world is revised with every tick of the clock and it knows no fixed rules. Success is attained by the man who has the courage to acknowledge his own shortcomings and has the strength to knock down his house of cards with the sweep of one hand, while starting to build a new house with the other.

(9 The line is very finely drawn between liberty and license and the "general public" exists only as a figment of the imagination. The American people resolve themselves into a number of separate groups, each one governed by its own interests.

(10) Civil life acknowledges no specific background for its canvas, has no time for recrimination or regret, and passes judgment on results only.

The above ten rules—be they "Commandments" in modern language, or not—were rubbed into me, individually and collectively, in my first business venture. There were exceptions, of course, but when I found one, I

felt like entertaining him with a large party, if I could find the means. To the best of my recollection, I made every error of judgment known to man—or, rather, I should simply call them "errors," as I had no judgment. I know that now, but I had to buy orchestra seats for first-hand information. I thought I knew something about finances, having disbursed about a quarter of a million dollars as officer in charge of a recruiting district and, by the same token, I thought I was a salesman. Added to these supposed qualifications the necessary capital, and my problem looked just like the simple planting of healthy young trees, and waiting—not too long—for the dense forest that was sure to be the result.

While busy planting my future timber I assimilated a few more truths.

The various class groups into which civil life is divided maintain energetic and partisan publicity bureaus, constantly disseminating propaganda. These agencies, provided with ample means and assigned definite objectives, carry on their advertising campaigns in every manner and under every guise possible in a country where free speech is a constitutional right.

In the parlance of news-gatherers, a morsel so choice as to gain front-page prestige has always been known as a "story," and the true interpretation of the word reveals that the editor may thus give prominence to either an "account of past events" or "a fictitious narrative, less elaborate than a novel." Whichever it may be, the average reader is just as gullible as ever, and applies the discolored gospel of the press to his daily activities.

No matter which way one turns, the face of nature has been altered and marred to exploit the products and by-products of the animal, vegetable, and mineral kingdoms. Except with the select, philanthropic few, the mission is not to reveal and make clear the truth, but to pervert the facts to suit the selfish desires of the propagandist.

This rain of publicity is not aimed at the servants of the government, but it falls upon them, at home and abroad, and its penetration is all the greater because of their lack of protective clothing in the form of mundane experience. They are not trained to differentiate between truth and falsehood, and jump at conclusions bred of their limiting environments.

The laws to prevent fraud require a basis of truth to every assertion, but it takes a skilled analyist to sift the wheat from the chaff, and what appears as a beautiful balance sheet may fall to pieces when the assets are boiled down to their basic worth. To arrive at a sane conclusion, there is required the ability, not only to separate quick assets from frozen assets and to segregate direct liabilities from contingent liabilities, but to take definite steps that will uncover the sins of omission and commission on the part of the accountant.

Each group is fooled by the other class groups, over and over again, and the professional group takes the palm for being fooled the most—the group to which the naval officer very distinctly belongs. The professional man is peculiar in being governed by certain ethics which prevent his retaliation for the blows he receives. He bears the mark of each one as an unbalanced debit entry, whereas the commercial man, the man in "trade," looks for the opportunity and welcomes the chance of making a credit entry, to show that he has delivered a compensating blow, and brags about it afterwards.

Money may or may not be the root of all evil—some people assert that it is—but I attribute the principal difficulty that delays the assimilation of the naval officer into civil life to the fact that, in his dealing with brother officers, he rarely uses this form of legal tender. No matter what he does or does not do, he still receives the pay of his grade, no more no less, and it takes him a long time to realize that his every move in the civilian world has a price tag attached to it. It is a shock when he finds out that most of the people in business owe their success to operations with other people's money, and that every hand is out for his money, if it can be reached.

Moreover, his training in obedience—both up and down the ladder—receives many a rude jolt. He has been used to having his orders carried out, just as he has obeyed those given him—cheerfully, we hope—but they were carried out, nevertheless. I thought I was fairly good in both these respects but, believe me, my egoism went down quite a few points. Unable, because of lack of training, to smooth out the rough spots in the performance of my subordinates, I tried to play every instrument in the band, and it very nearly broke me, financially and physically.

It took me eighteen months to learn the most important word in the commercial vocabulary of any language.—"No."

My naval training certainly taught me to keep from making the same mistake twice, and in my later business dealings I have assured myself that I was protected from every angle, and shall continue to do so. But oh, what an expensive education I had! Now, I know how to protect myself, and if I could set the clock back six years, the results would be very different. But the experience was just something I had to get —and I got it.

Before I started on a business career, a past master at the game said he would bet ten to one against me if I started as a distributor, three to two against me as a dealer working under an experienced distributor, and three to two for me if I bought an interest in a going concern. I took the ten-to-one shot, but, were I to do it all over again, I would assure myself that all the odds were in my favor or I would never leave the post. If I had capital, I would hunt around for a tried and successful business open to expansion. If I did not have capital, I would figure my Navy pay as interest at the rate of five-and-a-half per cent on a guaranteed investment, to equal the amount I would have to save to equal my present status. I would execute a cast-iron contract for a term of years with my respective employer, at a figure considerably higher than my Navy pay bearing in mind that no contract is better than the parties thereto.

From the point of view of one who has seen "both sides of the picture" in all their stark reality, I wish to close by observing that, compared with the average civilian business, the Navy looms as a positive monument of efficiency.

From a painting by William Steeple Davis *Copyrighted*

FROM OUT OF THE WEST

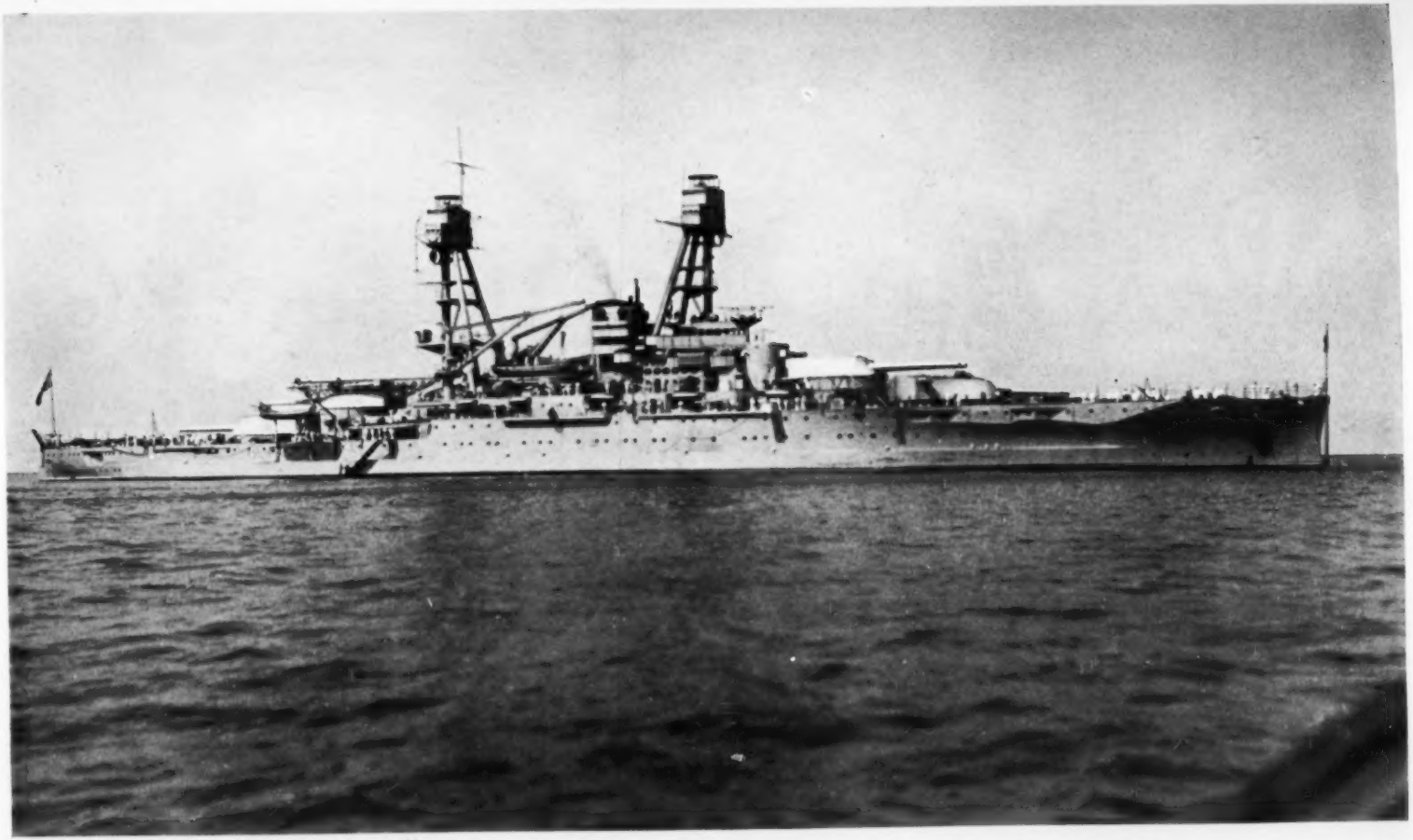
A merchantman of by-gone days with stuns'ls set, silhouetted against a sunset sky.

Courtesy Rear Admiral W. T. Cluverius, U. S. Navy

"READY"

The U.S.S. *Nevada* leaving the Norfolk Navy Yard after modernization.

The U.S.S. *Nevada* leaving the Norfolk Navy Yard after modernization.



Courtesy Lieutenant (J. G.) H. K. Perrill, U. S. Navy

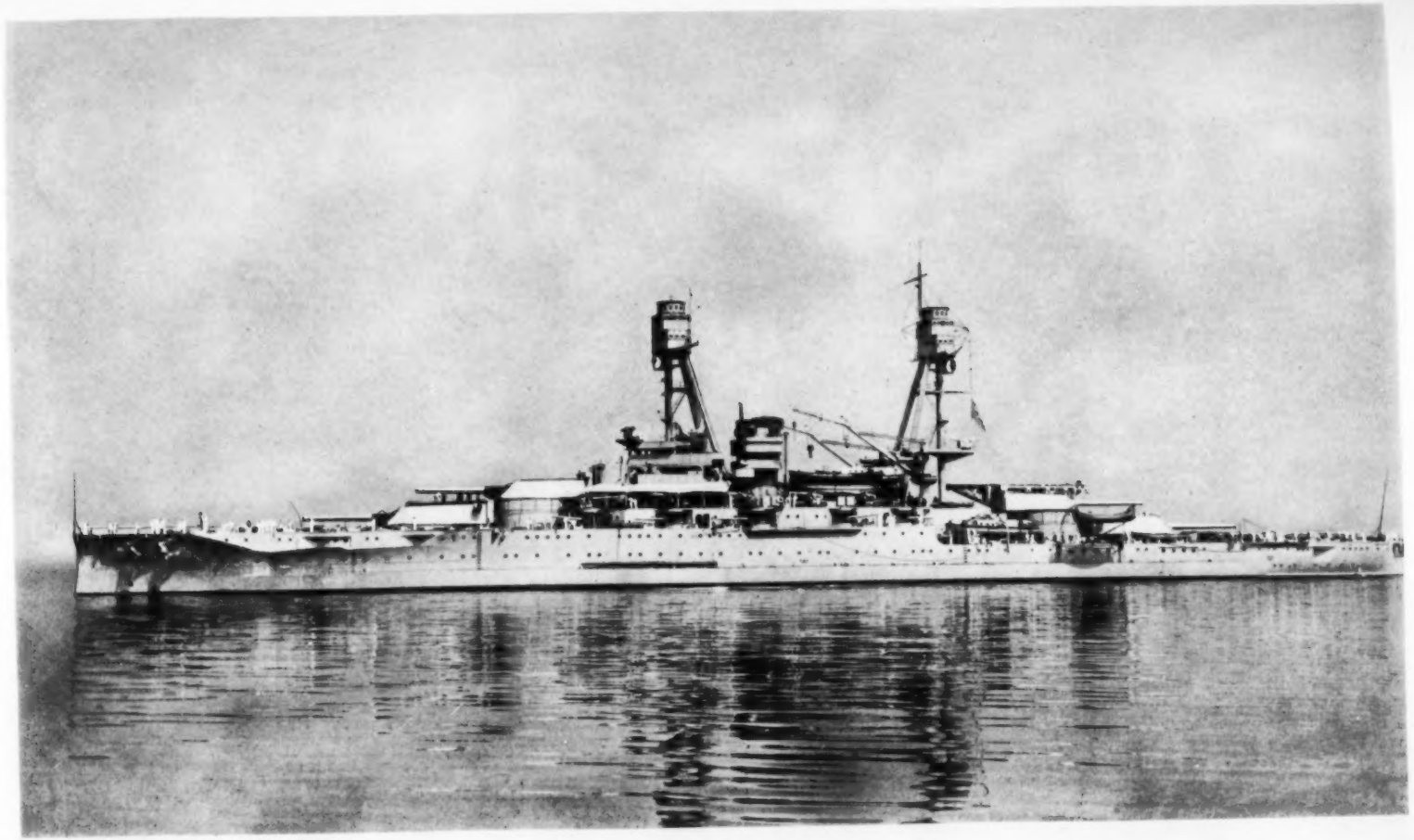
U.S.S. *NEVADA* AT ANCHOR

Lynnhaven Roads, Va., twenty-four hours after leaving Norfolk on completion of modernization.

International News Photos, Inc.

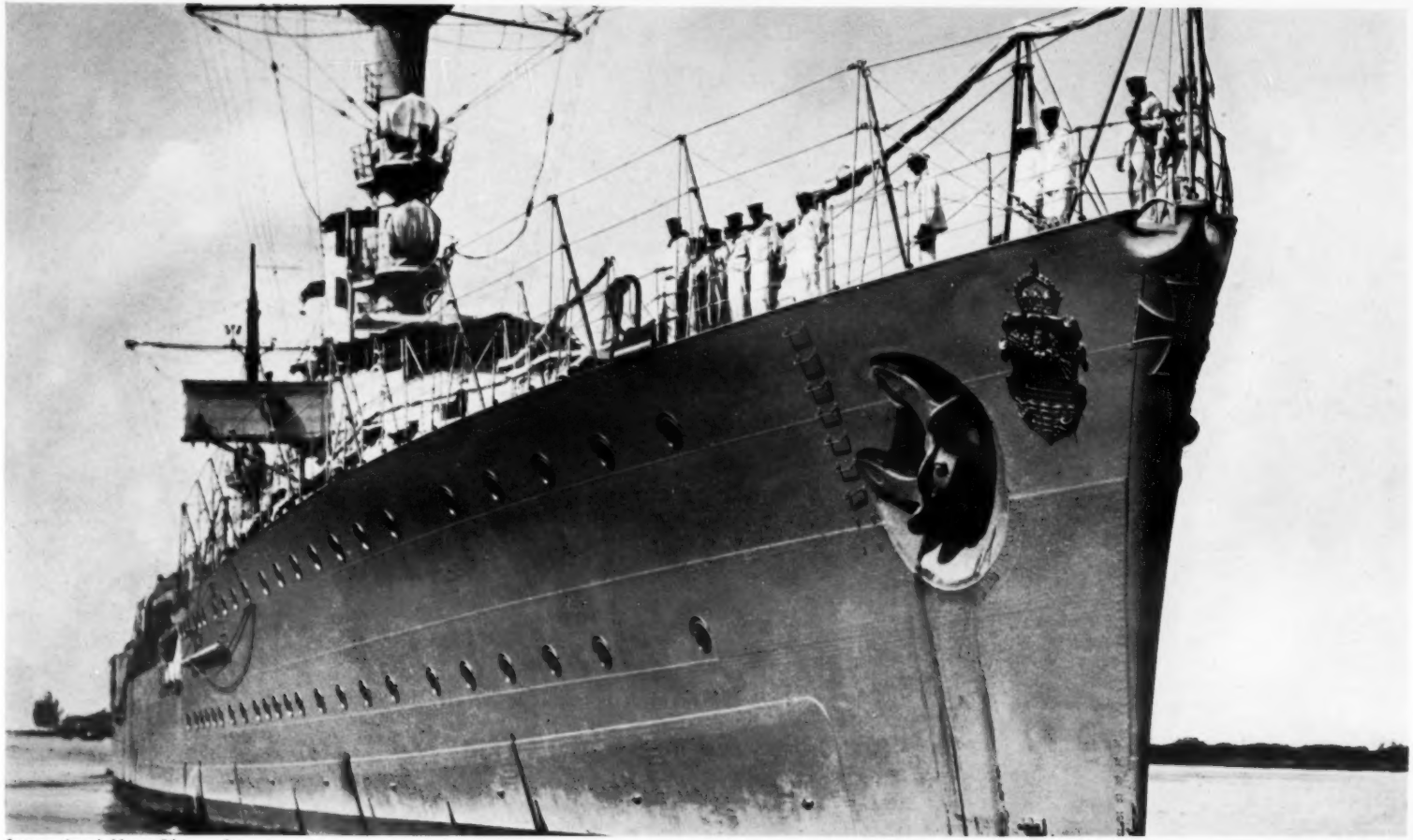
U.S.S. *OKLAHOMA*
Leaving the Navy Yard, Philadelphia, in her new dress.

Leaving the Navy Yard, Philadelphia, in her new dress.



Courtesy Navy Yard, Philadelphia, Pa.

BROADSIDE VIEW OF U.S.S. *OKLAHOMA*
After modernization.



International News Photos, Inc.

THE GERMAN CRUISER *EMDEN*

6,000 tons, arriving on her 'round-the-world cruise. Note the "Iron Cross" on her bow, which commemorates the exploits of her predecessor.

6,000 tons, arriving on her 'round-the-world cruise. Note the "Iron Cross" on her bow, which commemorates the exploits of her predecessor.

By Ewing Galloway, N.Y.

THE GOLDEN GATE

The square-rigger *Star of Alaska* being towed out of San Francisco harbor, on her way to sea.

By Ewing Galloway, N.Y.

THE WAILING WALL

The scene and cause of the recent troubles between the Jews and Arabs in Palestine.

THE WAILING WALL

The scene and cause of the recent troubles between the Jews and Arabs in Palestine.

By Burton Holmes. From Ewing Galloway

BRITISH TROOPS IN JERUSALEM

Constant watchfulness is required in order to keep peace between the various religious factions.

By Ewing Galloway, N.Y.

THE FLEET AT ANCHOR, SAN PEDRO, CALIF.

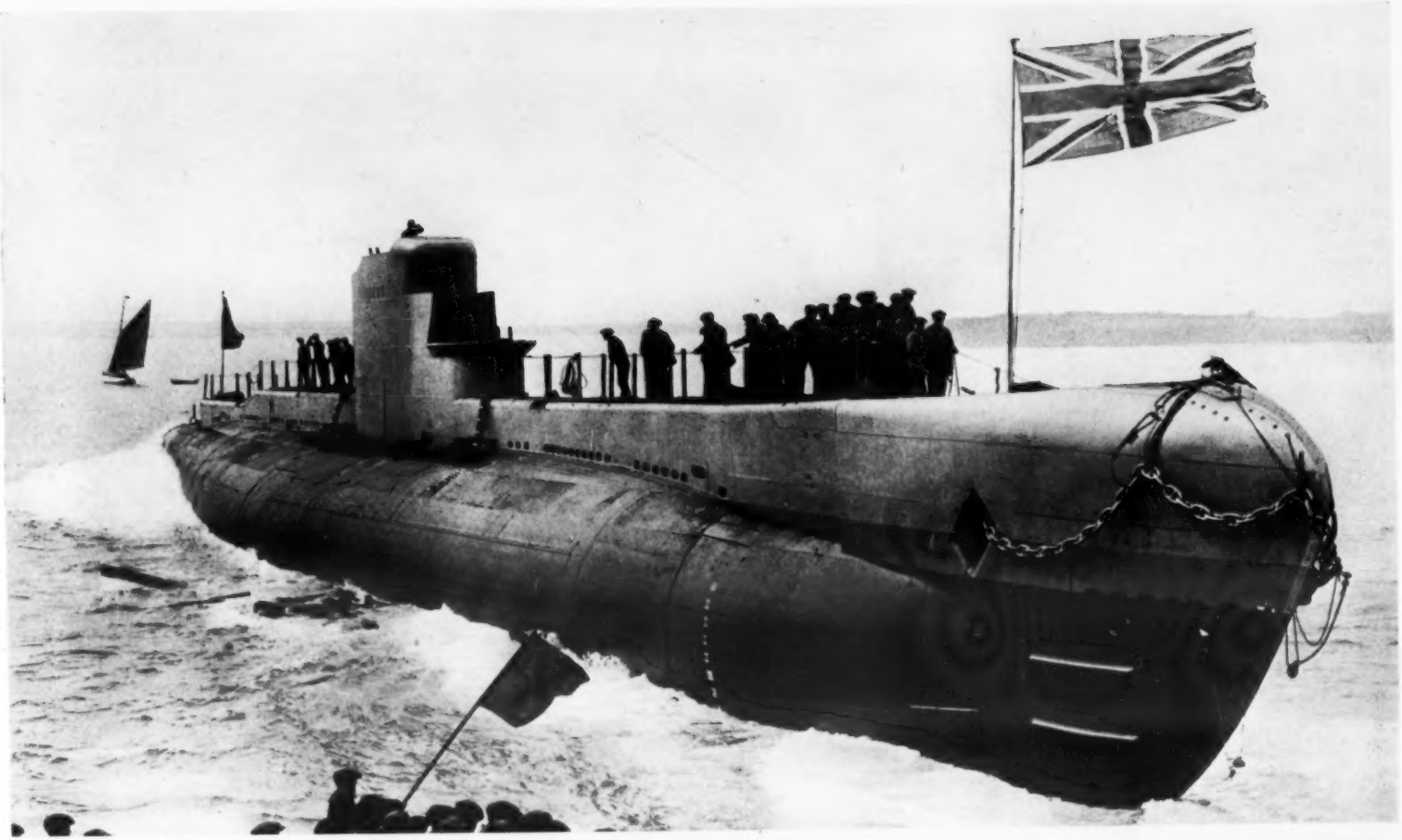
Excellent harbor facilities have been provided by the breakwater, which is only part of the contemplated developments.

Excellent harbor facilities have been provided by the breakwater, which is only part of the contemplated develop

Courtesy Lieutenant Commander C. S. Alden, U. S. Navy

THE ROMANCE OF THE SEA

A beautiful view taken in the summer of 1921 from the submarine U.S.S. *S-17*, showing the U.S.S. *Beaver*, tender, and the U.S.S. *S.-15*.



Herbert Photos, Inc. N.Y.

H.M.S. *PERSEUS*
A new addition to the British submarine fleet

A new addition to the British submarine fleet

Courtesy Navy Recruiting Bureau, New York

TEMPLE OF HEAVEN, AT PEIPING (FORMERLY PEKING), CHINA

Courtesy Walter Johnson, Chief Photographer, U. S. Navy

NAVY'S *ZMC-2*

Arriving at Lakehurst, N.J. This airship is a departure in airship construction in that the balloon covering is entirely of metal.

Arriving at Lakehurst, N.J. This airship is a departure in airship construction in that the balloon covering is entirely of metal.

From a painting by William Steeple Davis

IN THE TRACK OF THE MOON

Copyrighted

Courtesy Navy Recruiting Bureau, New York

THE OLD WALL, MANILA, P.I.

Nelson *and the* Court-Martial Tradition

By FLETCHER PRATT

AFTER one of the finest victories in naval history, when he was on his way home with five captured battleships and the enemy's admiral as a prisoner, Admiral Rodney wrote: "I will say that three of my captains were brave and gallant men who did their utmost to destroy the enemy. Nothing on earth will persuade me to go further." Sixteen years later Nelson was beginning an announcement of the Battle of the Nile with the words: "I had the happiness to command a band of brothers."

Between these two statements a moral revolution had taken place in the British Navy, a revolution brought about by Nelson, but lost sight of in the halo of brilliance surrounding his strategic and tactical achievements. Briefly, it consisted in this, that he sank the commander in the leader and the friend. The ship captains of 1798 were not vastly better than those of 1782; indeed, many of them were the same men. The difference between Nelson's warm appreciation of his subordinates and Rodney's damning with faint praise was the difference between two traditions; and the tradition that Nelson introduced—the tradition that drilled coöperation is better than blind obedience—has persisted in the British Navy and spread to every other fleet of the world.

The outward sign of this inward change is the break Nelson made in what may be called the "court-martial tradition." For a century before his time nearly every British naval battle of importance had been followed by a court-martial. If the battle were a British defeat an admiral was brought to court; if it had been a British victory, one or more captains were called upon to explain their conduct. In most of the latter cases the faults were, to say the utmost, venial, and in many it is difficult to find any fault at all.

Of course in a case like that of the unfortunate Byng, when an important possession is lost because an admiral has turned tail after losing a skirmish, a court-martial is a perfectly natural result. So also when a captain loses his ship. It is not to such instances we refer, but to the habit, deep-rooted in the British Navy, of holding courts-martial on incidents that at this distance look trivial. This habit was ended by Nelson, though in every one of his battles he had reasons as good as the admirals who preceded him for holding courts.

The unfortunate tradition seems to have had its beginnings in two causes. One was the English Revolution. Before and long after this event every naval officer was a politician; promotions and appointments went out from Whitehall and the aspiring post-captain must spend a certain amount of time at court if he was to hope for a ship. Even as late as 1781 a change in the ministry brought about not only new appointments to the command of important fleets, but changes in many of the ship commands as well. Out of this combination of the sea captain and the courtier grew the impression that captains were not wholly to be trusted. They might (like Lestock) hang back while a political enemy was taking a beating from an enemy of the country.

The second and proximate cause was a battle in which the captains (whether for political or other motives) failed in the most disgraceful manner to support their admiral: the celebrated combat between Benbow and Du Casse in 1702, which cost the former his life. Whether or not Du Casse wrote the famous letter ending with, "As for those cowardly captains who deserted you, hang them up, for by God, they deserve it," the Admiralty took the advice. Benbow's last act was to file charges against Captains Kirby, Hudson, Constable, and Wade. Kirby and Wade were found guilty of cowardice and shot; Hudson died; and Constable, guilty of disobedience and neglect, was cashiered and imprisoned.

In this case there could be no question of the justice of the court-martial or its verdict. But the precedent had been set, and a distrust of the honor and intelligence of sea captains became a tradition. Both the Walpoles allude to it in their letters. In the very next sea battle, we find the admiral making charges against his captains, this time without so much justification, and for a century afterward every British admiral who won a battle had one of his captains tried.

The battle was that off Velez Malaga in 1704. It is rightly counted a British victory. The French lost some ships and the English won Gibraltar, but Rooke, the British commander, had several of his captains brought to trial and two dismissed their ships. The offense was that after maintaining close action for a time they had hauled out of range. The reason was that the English service of supply, not so good then as now, had not provided these ships with enough ammunition. They remained in action while their powder lasted, then, lacking any means of offense, drew off.

Four years later Admiral Wager was attacking the Spanish treasure fleet off Cartagena. His victory was singularly complete for those days. Only one of the five Spanish ships escaped. But Captain Bridges of the *Kingston* and Captain Windsor of the *Portland* were found guilty of not bearing down, and dismissed. The *Kingston* and *Portland* (both 44's) had been the ships that drove the Spanish flagship (a 64) aground and burnt her.

From this time to 1740 England was at peace. In that year the War of the Austrian Succession opened, and through all the naval battles of this and the following Seven Years' War, the precedent of holding a court-martial after a battle held undiminished.

The first one followed Admiral Knowles' unsuccessful attack on Puerto Cabello in 1743. The *Norwich,* 50, was at the tail of the British line. Her cables were shot away, and there being no breeze, she drifted out of action. Her captain, Gregory, was dismissed the service.

Matthews' celebrated action off Toulon was the next battle. If not a defeat for the British fleet, this was certainly little more than a drawn battle, and it is perhaps only natural that courts-martial followed. But even Mahan, who is concerned with matters of strategy and tactics rather than morale, is astonished at their number. Everybody knows the story. Matthews accused his rear admiral, Lestock, and six of his captains, of lagging; Lestock filed counter-accusations against Matthews and five captains. Lestock, who happened to be on the right side of the political fence, got off; Matthews and seven captains were condemned, the admiral for breaking the line to attack the enemy, the captains for not following him out of the line when he broke it, "a decision which smacks more of the Irish bull than the Irish love of fighting," as Mahan sapiently remarks.

The next fleet action was that between Hawke and L'Etenduere—the most complete naval victory till Nelson's time. Nevertheless it was followed by the usual court-martial. Captain Fox of the *Kent* was tried for disobedience of orders. His excuse was that he had mistaken the signal for close action for one to come to the aid of the admiral; neither this nor the fact that he had fought his ship gallantly could save him. He was dismissed, and "he was judged by many to have been treated with no small severity," says a contemporary account. It it worthy of note, in passing, that Nelson made fewer signals than any admiral of sailing-ship days. It was one of the means by which he effected the moral revolution.

In the next year (1748) Admiral Knowles fought a battle off Havana. Usual victory, usual court-martial. Captain Holmes of the *Lenox* was the subject. He had been conducting a convoy when the battle loomed up to leeward, and hastened to join in. Knowles brought charges against him for leaving his convoy, but it is pleasing to record that Holmes, whose gallant conduct made the victory possible, was acquitted.

Byng's battle was the next, but as this was a British defeat, and the court-martial was perfectly justified, it hardly enters the scope of this article.

With Pocock's first two battles with d'Aché off the Coromandel coast the case was different. In the first action Pocock formed a line of bearing and came down to attack the French fleet, which lay to leeward. The *Cumberland,* third British ship from the end of the line, was exceedingly sluggish and so foul that she had to be laid up after the battle. She could not

keep station with the van, and held up the two ships behind her, the *Weymouth* and *Newcastle*. The captains of all three were court-martialled; Brereton of the *Cumberland* lost a year's seniority, Vincent of the *Weymouth* was dismissed his ship, and Legge of the *Newcastle* dismissed the service.

After the second battle (in which the case was similar) there was another court. The *Weymouth* lost her foreyard and the *Elizabeth* her fore topmast at the first broadside. Both fell away out of action, but their captains were acquitted in the courts-martial that followed.

Boscawen's action with De la Clue in 1759 produced the next accusations by an admiral against his captains. A French ship, the *Ocean*, had gone aground, and the *Intrepid* was ordered to attack her. Captain Pratten of the *Intrepid* faced a court-martial for not doing it. The court, however, found his excuse that he had lost some spars and was anchored on a lee shore with a heavy sea running, valid.

In November of the same year came the battle of Quiberon Bay. During the night and battle Hawke signaled for his fleet to anchor. The signal for anchoring was then two guns fired to windward. With a battle going on, it is extremely unlikely that anybody paid any attention to Hawke's two guns. Nevertheless Captain Speake of the *Resolution* and Captain O'Brien of the *Essex*, whose ships went on shore, were court-martialled—not for the loss of the ships, but for disobedience. Both trials resulted in acquittals.

This concludes the tale of the battles of the Seven Years' War. Only two of them were not followed by courts-martial, despite the fact that after the Byng affair every fight was a British victory. In the next war, that of American Independence, there were two admirals who never called for courts-martial on their captains. These two were Hood and Hughes. Hood never fought a general fleet action, and Hughes lost so many officers in his desperate fights with Suffren that whether he wanted to court-martial them or not, he didn't have time. It is noteworthy, however, that Suffren, the victor in these fights, sent some of his captains home and suspended others.

Leaving India out of it, the court-martial tradition remained as strong as ever. Byron's pell-mell attack on D'Estaing off Granada was followed by a court on Cornwallis of the *Lion*, one of the British ships that got isolated and mauled in the beginning of the battle. As no record of the court remains and Cornwallis continued in his command, it is likely that he was acquitted. Keppel's action off Ushant was followed by a court-martial of the admiral (which is outside our province) as well as one on Captain Brereton of the *Duke*. Brereton, whose physician swore he had been confined to his cabin with a high fever and had drunk nothing but tamarind-water (whatever that is), was found guilty of drunkenness and dismissed the service.

Rodney's battle with Guichen brought a court-martial on Captain Bateman of the *Yarmouth*. The *Sandwich*, *Yarmouth's* next ahead, had beaten her opponent out of the line, and the *Yarmouth's* opponent moved up to engage the *Sandwich*. Bateman, with that fanatical devotion to the line which then characterized British captains, luffed up out of action to preserve his station. The record of this court is also missing. The next court-martial followed Suffren's coup de main on the British fleet as it lay in the harbor of Porto Praya. When Johnstone, the British commander, got his ships out of harbor in pursuit, Captain Sutton of the *Isis* signaled that his ship had lost some spars, was making a good deal of water, and that he was unable to keep station. Johnstone promptly put him under arrest, but he was also acquitted.

The next battle was Rodney's greatest victory, the one in which he broke the French naval power and captured De Grasse. It was after this that Rodney complained so bitterly of the conduct of his captains. The Admiralty, which was unfriendly to Rodney at the moment, found no grounds for court-martial in his indefinite but decidedly strong charges, but Rodney carried them into the journals of the day with such vehemence that two captains, Carkett of the *Stirling Castle* and Edwards of the *Cornwall*, challenged him to duels.

The wars of the French Revolution opened with the court-martial tradition in full force. After the glorious first of June, Captain Molloy of the *Caesar* (one of the three who had been complimented by Rodney in 1782) was dismissed for "not having done his utmost to bring his ship to

close action." The *Caesar* had been leading the line when a signal to tack was made. She came up in the wind with sails aback, Captain Molloy's excuse being that his mizzen was shot through and his rudder so damaged by a shot that he was unable either to tack or carry a press of sail.

Camperdown was the next fleet action to bring a court-martial. Duncan, the British leader, signaled for his fleet to form on a line of bearing and come down to engage the Dutch, ship to ship. Some of the British ships were so old and crank that the line could not be formed, whereupon Duncan signaled for each to engage the ship nearest to her. Captain Williamson of the *Agincourt* was court-martialled for not having engaged his opponent. There was no question of his having been in action; it was merely that he had not fought with the correct Dutch ship. As to which ship he should have engaged the court-martial declared itself unable to pronounce; he had not engaged his proper opponent however, so they found him guilty, inflicting, says the only available record, "heavy penalties."

But by the time Camperdown had been fought the new order of things was on its way. Camperdown took place in October; in February of the same year, the Battle of St. Vincent had been fought. It is different in only one way from those we have been considering, and the difference was that Nelson was the only man who could possibly have been court-martialled.

At 10:57 A.M. on that day Jervis had signaled to form line; at 11:26 he signaled that he meant to pass through the enemy's line; at 12:15 P.M. he signaled to pass through the enemy's line; and at 12:51 to engage in succession, preserving formation. Nelson, in the *Captain,* answered every one of these signals, and with the repeat pennant on the last still at his masthead, left the line and tacked around to cut off the two sections of the Spanish fleet which were trying to join. Now here was a clear case. Nelson had left the line, exactly like Matthews; he had engaged the wrong opponent, exactly like Williamson, and if Fox could plead he had mistaken the admiral's signal, Nelson had disobeyed orders with no possibility of misapprehension.

There must have been a terrible stewing at Portsmouth over it. But neither Admiral Jervis nor the Admiralty at home could bring themselves to try the man who had turned a doubtful battle into a stunning victory and who had carried two enemy battleships by boarding.

There was no court-martial. The insubordinate commodore actually received a K.C.B. It was the first clear break in a hundred years' tradition; the first time an English admiral had won a victory without sending some officer home under arrest.

And then Nelson got an independent command. One of the first things he did was to ruin the tradition of awful isolation that kept an admiral apart from his captains. He invited his captains to breakfast. He discussed the possibilities of battle with them, and went into the details of what he meant to do in case the French approached from this side or that. He invented an informal type of *Kriegspiel,* drawing diagrams of likely formations on the part of the enemy and what formations he meant to adopt to crush them. He let his captains see that he honestly believed them the finest body of men in the world and he repeatedly said, "That captain cannot be very wrong who lays his ship alongside the enemy." No court-martial like those on Williamson, Fox, or Holmes in this case!

It must have been immensely stimulating. It was also immensely valuable. When the day of battle did arrive, and Nelson's fleet sailed into the estuary of the Nile where the French lay at anchor, every captain knew his place so well that hardly any signals were necessary; there was no chance for mistakes. But Troubridge of the *Culloden* did make a mistake; he ran his ship aground, smashed her rudder, and did not get off till the battle was all over—and then she had seven feet of water in her hold. Captain Sutton of the *Isis* had been court-martialled for far less than this. The Lords of the Admiralty waited Nelson's charges against Troubridge. Instead they got "Poor Troubridge!" and the hope that Troubridge would not be left off the honors list for the battle which, after all, was only the end of a campaign in which poor Troubridge had done more than his share.

Now here is a remarkable change from the state of things under Matthews, or even under Rodney and Hawke. The latter two were great tacticians and strategists, no doubt, but they were nowhere near to approaching Nelson's control of morale, and

"in war," says Napoleon, "the moral is superior to the material as four is to one."

The changed state of affairs was noted once more at Copenhagen. Nelson's own disobedience of Parker's order for withdrawal has received abundant comment, but the action of the frigates has not. Captain H. Riou in the *Amazon* was the senior officer of this light squadron which was in rather too heavy company against the blockships and forts of Copenhagen. When the signal to withdraw was made by Admiral Parker, the frigates drew out of action, headed by the *Alcmene*. Riou was killed and all the frigates were raked as they withdrew. Now the *Amazon's* log says she withdrew only when deserted by the other frigates, not remarking on Parker's signal at all. The *Alcmene's* log and the *Alcmene's* captain declare that the *Amazon* repeated the signal for withdrawal, whereupon the *Alcmene* left, the *Amazon* unaccountably lingering. Under the system in vogue before Nelson's time, Captain Sam Sutton of the *Alcmene* would have at least faced a court of inquiry. But under Nelson there was only sympathy for Riou's loss and congratulations and honors for all the other captains. "I have the happiness to command a band of brothers."

After Trafalgar there was an even clearer case for a court-martial, and the fact that none was held is the clearest possible indication of how one man can break down a bad, old tradition and substitute for it a new and better one. The last scene of Nelson's life has been so frequently reported that it is only necessary to remind any reader of naval history that almost his final words were, "Do you anchor, Hardy. Do not fail to anchor." He said it not once, but several times, and earlier in the day he had signaled the rest of the fleet to prepare to anchor after the battle.

Hardy did not anchor. Neither did Collingwood, on whom the command devolved, and as a result most of the captured ships were lost or escaped in the storm following the battle. How far the dead hand of a deceased commander's order is binding on his subordinates is not clear, but Nelson certainly gave the order while still living and it does not appear from the signal log of the *Victory* that Hardy ever signaled to anchor. His failure to do so resulted in obvious loss and had the Benbow tradition still ruled would probably have resulted in a court-martial.

Nothing more clearly marks the acceptance of the new tradition than this. Hardy was a brave, intelligent, and honest man who had done well in his effort to destroy the enemy. This was all that Nelson asked, and all that has been asked since in any navy.

That the Nelson rather than the court-martial tradition still rules is obvious from even a cursory examination of the battles of the World War. At Jutland, the *Warspite*, her steering gear out of order by reason of a shell, left the line and circled around thrice. This was the exact reason for which Captain Molloy of the *Caesar* had been tried, found guilty, and dismissed; but nobody thought of court-martialling the captain of the *Warspite*. At Coronel, the slow old *Canopus* could not get up in time for the battle, and Cradock was crushed. This was the exact reason (minus the British defeat) why Brereton of the *Cumberland* had lost a year's seniority by sentence of a court-martial; but there was no suggestion of a court to try the captain of the *Canopus*.

The change, great though it is in practice, is only one of viewpoint. Nelson looked upon his captains as honest and able men devoted to the cause; the eighteenth century looked upon them as more or less scoundrelly individuals who could only be brought to do their best through fear of punishment.

On the Other Side *of the* Mast

By LIEUTENANT COMMANDER J. M. CREIGHTON, *U. S. Navy*

WAR forces upon naval officers an intimate coöperation with the officers and men of the merchant marine for which our ordinary activities poorly prepare us. As a typical officer, I felt in myself an uncomfortable ignorance of merchant-ship construction, quality of personnel, and systems of operation; and that these might not rise up some day to defeat me in searching for contraband or properly taking over a prize, I shipped out of Manila before the mast on the *President Lincoln,* bound across the Pacific.

A quartermaster, discharged there for some drunken Hongkong brawl, afforded me a berth, and airily bequeathing me his bedbugs and locker, he disappeared up the sunlit dock with a wave of his hand.

Below in the fo'c's'le, my new shipmates were stewing in their pipe bunks, clad in their underclothes. One had been on watch at the gangway and came down to hear the gossip. Two others lolled on their mattresses in the dripping heat, inert, hairy legs or arms hanging over the edges. A fourth was tense in the upper berth, the *Adventure Magazine* held to his eyes, while he breathlessly followed the hero in the reprint of Rafael Sabatini's *The Sea Hawk,* oblivious to the brass he should have been shining on the bridge.

"Our crowd" was to consist of four white quartermasters, a white carpenter, and two Chinese carpenter's mates, a Filipino bos'n and a Filipino bos'n's mate; and thus we sat at table. The deck crew was solid Filipino. It turned out eventually that the Filipino bos'n owned them, body and soul. He brought them along with him when he hired aboard himself, and took a generous nick out of their monthly wages to remind them of the fact. Aft, and in the waste of that mysterious and labyrinthian space called "the lower decks," were quartered the engineers. The water tenders and the throttle men—the leaders below—were white; the rest were partly white and partly Filipino.

There was a heavy languor in the air. The ship had lain already three days in port. The combination of work-all-day and out-all-night had removed the stored-up energy and health which the last period at sea had forced upon the personnel, and the heat completed the destruction. Everything languished, or moved with slow surliness. And at best, theirs is no life of sprightliness.

We sailed at four, beautifully bright and clear, just as the tropic night was to be an hour or more later. The dock people got the gangway ashore in the roar of our departing whistle. I worked with the fourth mate to stow away the gangway gear, secured the port, and then climbed to the weather bridge, seventy feet above the water, to take over the watch from the "Old Man" and the "First," who were seeing her out through the breakwaters.

We moved slowly across the placid bay, the evening coming on, the towers of Manila becoming moment by moment less distinct as the sun sank. Corregidor was passed to port, the lights just beginning to appear here and there in the shadows of the orderly mass of barracks and quarters.

Three of the QM's stood "a trick in three" at the wheel. The fourth was a "day man," standing no regular watches, but at work for eight daylight hours, charged with keeping the three bridges scrubbed and shined. I fell into the "four to eight" every night and morning, and thus had all the sunsets and sunrises, and the thrill of steering her through the towering entrances to Hongkong on the third day's dawn.

However you approach Hongkong, it overawes you with its strength and its beauty. The channels are at the mercy of the towering heights. The harbor itself is one of the most beautiful and spectacular and romantic in the world. The hills rear themselves up from the waterfront until their heads are lost in the morning mists, or are silhouetted against the faint dawn of the sky. Sampans

move slowly over the placid surface of the bay, propelled by heavy-hanging sails, and assisted by the sweeps of the families within them. Blue Funnel steamers, dingy sea tramps, black Japanese, heavy Dutchmen, lie to their moorings, their night lights becoming dim in the oncoming day, sending soft, thin, vertical columns of smoke into the still air.

We went to the dock in Kowloon, across the bay from the town and island of Hongkong, on the Chinese mainland.

The landing was made excellently.

I know of no alteration so abrupt, no change of circumstances so bewildering, no such shift from easy quiet to stupefying and instantaneous uproar, as to progress slowly across the placid waters of the bay in the early morning, and then secure to the dock as we did that day in Hongkong. I have never been reading quietly in a house which was struck completely and immediately to the ground by lightning, to be left in the midst of torn walls and crashing roofs with the book still in my hand. But the sudden rush from a quiet game of wardroom bridge to the totally unexpected clang of a night general quarters staged by a "sundowner" is nothing to compare with what had happened. In the latter case the alarm and rush are orderly. People know where they are going, and go fast, with incredulous curses. Here it was pandemonium. A rush, a roar, and a fight, with howls of rage and yells of impotence, and the whack of sticks on bare backs as the dock police and Sikhs fought their way up the gangways.

The Chinese assailed the ship by hundreds. An up-country revolution had cut down all commerce for months past and these dock hands and waterfront men were desperate for work. Their opportunity was over in half an hour, and empty stomachs were driving them. The first aboard was the one who secured the pay. They roared and milled at the gangways; they clutched at the mooring lines as though to climb up bodily and assault the ship over the rails; they placed long, heavy bamboos along the tall sides and endeavered to reach the passengers with flaming advertisements, to secure their baggage to be transported, to "tag" them for future service when they came ashore. There were peddlers, hawkers of trinkets, boarding-house runners, hotel agents, baggage people, ricksha men, food venders, porters, fighting and pushing and yelling, their arms waving in wild appeal, straining eyeballs searching out each face along the crowded sides for a beckoning hand or a recognizing glance.

The storm broke upon us at once. The fourth mate's place was at the forward gangway with his quartermaster. We came quickly from the bridge to the gangway port, took two handy, sawed-off broom handles from the locker, and waited for the gangway to be dropped into its chocks.

With its touch, the flood! The police were swept aside. The passengers didn't have a chance. They didn't even try to leave the ship until the thing had been settled.

It was sock! bang!—and let 'em have it! They panted, and pleaded, and yelled in the gangway. They clung to the edges and rails and tried to pass around us, hand over hand on the platform and rails. A crack on the hands and they fell off. Kick and shove and beat in front; beat, shove, and kick at the side, and they fell back, to come on again. Out of the howling and uproar we could see two mates at the after gangway, clubs going up and down, and feet flying out in front, yelling and damning with the rest.

Mixed up with the assault party were numbers of Chinese who were entitled to be admitted aboard: the agents from the steamship agencies and the big hotels, messages in hand. As we could, we rescued these from the baffled and howling remainder, to allow them to pass indignantly inside, smoothing their clothes and looking eternally injured; or we shot them back with the rest, to have them scream and yell with the fury of Minor Persons who have endeavored to exalt themselves among their kind, and are publicly and obscenely hove back among those whom they have been disdaining. But they were all dressed alike! It was impossible to tell duke from devil in those clothes, and that mess was no place for delicate delineation in station.

Of course the thing could have but one ending. The shore police finally beat their way up and we beat our way down. Undoubtedly some got aboard who were not entitled to admission, and we gradually winnowed out those still remaining, whose business was important enough to the ship to permit them to enter. But it was a most amusing and stirring uproar while it lasted, and we had time to laugh and raise a greeting hand to the Defenders of the After Pass

who had paused in their victory to give us a hail.

An hour later the first cabin passengers began to leave the ship, bound for the Hongkong-Kowloon ferry, to tea at the Grand, to Peak House, to Canton by boat, to Heaven-knows-where in the hands of those ever-present Cook's guides.

The steerage people dribbled out for hours. The fighting up the river had raised the price of revolvers to five or six times their cost in Manila, and the British police and their Sikh helpers "went through" these humble travellers in a most satisfactory and complete fashion. Everything came out. Everything went upside down. Nothing that looked liked a double bottom to a trunk or a false side to a suitcase had a chance. Even books were held up inverted and their pages "fluffed" to insure that nothing His Brittanic Majesty thought undesirable should come in to disturb his provinces of the East.

There is a rumor about that the Sikhs are imperturbable. They went wild in the first rush, and yelled and howled and thrashed around in a passion of excitement. As the Chinese broke through their thinly held lines, their usually placid expressions changed into those of fury as they realized that authority was slipping from them, and they laid about them with such yells and distortions of countenance as, in an Irishman, would have been the prelude to homicide. A dozen New York policemen could have handled the thing with ease, and the assault on the ship would never have occurred.

We lay here four days. Four days of loading and unloading cargo, of painting, of minor repairs. Four days adrift along the docksides of Kowloon or in the streets of Hongkong. Four nights in the weird streets and back alleys of the Chinese city, or up in the peaceful, tree-lined ways of the upper stretches of the foreign settlement. Instead of our tricks at the wheel, the quartermasters stood a placid gangway watch to keep thieves out of the ship. Nothing else is demanded of these easy living gentlemen in port.

Dockside loafing is the most romantic of trades. There is nothing at all on one's mind, and one sits on a stringer piece in the warm sun and watches booms working out over the side of the ship, far overhead against the sky.

The cargo hooks swing high, drop into the depths of the hold, and reappear again, loaded with bales and boxes. They hang poised for an instant, far above as the boom is settled for plumbing the waiting car on the dock, and then descend silently and swiftly as the wire rope runs smoothly over the sheaves.

Long lines of small iron cars are pushed along the dock face by the half naked, half starved Chinese coolies, and these receive the goods for the warehouses. The native cargo checkers, their dress patterned exactly upon that of their white superiors, sit on top of piles of merchandise in immaculate and clerkly superiority, relishing the precision of their accounts.

Flour goes by, and sewing machines; steel rails, sheet iron, Carnation milk, wire, cigarettes, cutlery, haberdashery, canned fruit—all the endless list of things which people in far-away America manufacture and send across the world so that they may become rich at home.

The air is filled with the soft "tonk, tonk" of the caulking hammers as our weather decks are repaired. The *Indies Maru* across the wharf casts off her lines, turns slowly in the warm sunlight of the bay, and heads away for Singapore.

Stages are slung over our sides for painting. On the wharf a policeman goes methodically through every item in the suitcase of a late-departing Chinese passenger. The band practices aboard. Tugs haul in and out with barges alongside. Sampans move slowly about the harbor, the elders on the poop deck aft, several children hauling and pulling backward and forward on the sweeps swung from outriggers near the bow.

Flags float lazily in the air. Steamers of many nations and many colors lie to their anchors in the smooth water. There is no wind. On leaving the funnels, the smoke rises in a lazy and indeterminate fashion until it reaches the breezes of the upper strata of air, and there spreads into thin horizontal layers and shades out quickly to leeward. High in the hills, houses betray themselves in white patches against the green of the vegetation.

With the approach of night, the harbor takes on a new beauty. Lights appear in clusters where the city edges the bay, and gleam yellow and soft in the fine haze of smoke and mist which rises in the air. Aloft, on the hillsides, groups of yellow spots come out of the murky background of the elevation

to mark the location of the hospitals, the winding roads, and the homes of the wealthy on the upper ledges. The steamers loading at the wharves turn on great cargo lights, which illuminate the deep holds and the groups of barges receiving boxes and bales alongside.

With darkness upon us, the quartermaster at the after gangway was relieved by a dock Sikh, and these watchmen gradually took over the policing of the ship and the gangways, leaving only one quartermaster on duty forward.

At four the next morning the whole scene was very still and serene. The lights in the hills were out. A few straggled at the dock-sides. At moments the great ship echoed the barks and whimperings of a brood of Chow puppies, en route to the Land of Demand, and, barely ten days old, engaged in climbing up the commercial chute of price inequality between three "Mex" in Hongkong, and forty "gold" in 'Frisco.

At about six, the city began to stir. Dawn broke over the hills to the east. Chinese harbor craft, whose movements had previously been shrouded in darkness, now became apparent, moving slowly about the bay under the action of their sweeps. The winches of a Dutch steamer which had been loading all night across the dock now ceased their whir. She hauled aboard her mooring lines and backed away from the wharf. Shortly after, a blur of smoke in the east channel marked her departure.

The day shift of policemen now relieved their fellows of the night, who stumbled off, fagged and stiff, to sleep. Their successors fell to spirited conversation in Indian or Chinese, according to their heritage, and I fell to chasing Chinese stewards, room servants, and all such minor fry from the privilege of the passengers' entry port to the gangplank of the steerage.

On the third day, the *President Pierce*, out from Seattle, secured to the opposite side of the pier. Her purser's clerk was an ex-temporary paymaster in the Navy. I had been the judge advocate of the general court-martial which led to his dismissal three years before.

In her fo'c's'le was a boy who claimed to be the son of an admiral in the Navy now on the active list of the line, with the admiral's pictures and letters to bear him out. A big, hearty wight, very popular, and famous for being able to get his hands on anything he wanted in the ship, no matter how securely it might be screwed down. Their quartermaster's room was very bright and attractive and clean; everything painted white. Ours was a foul place: all dirt, old shoes, underclothes, boots, hats, and buckets of dirty water about the decks; rusty lockers; grimy wash basin with no plug. We had a surly crowd aboard and very little fun in them.

We cleared for Shanghai on the fourth day, in the late afternoon.

The vessel steers, in fair weather, from the top of the flying bridge, high above the water, and open to the sky. A fine, airy place to man a wheel. And it is a beautiful feeling to swing a big ship through the turns in a channel, and watch her great bow move obediently to the mark—much more fun than giving the orders, for example!

We made Shanghai in two days, and lay at the mouth of the river that night to load. The cargo was brought down from the town, and all night long, lights burned overside and above decks, men shouted, winches whirred and stopped, barrels, bales, and boxes tumbled below.

We cleared at dawn for Shimidzu, at the foot of Fujiyama, and that symmetrical peak lay sharp and clear against the sky as we lay at anchor all of a day, waiting for midnight to terminate the celebration of the Emperor's birthday and let us go ahead with our loading.

With the stroke of twelve the winches began to turn. A cargo of tea for fast transportation. Before the sun rose we were away again, for Kobe and Yokohama.

In Kobe we picked up two beach combers whom the consul was sending home. They were from the Barber Line steamer *Stanley*. They had gotten drunk in the Korean port of Chemulpo, missed their ship when she sailed for Dairen, hoofed it to Seoul, and our consul there had sent them to Kobe. Here they had been five weeks, begging in the streets, living under a dock, and being all the time one jump from starvation. One of them was a big husky with a B.C.D. from the Navy. The consul in Kobe finally shipped them out on the *Lincoln*, and as they were down aft with three hundred Chinese and Filipinos in the steerage, with rice to eat, we brought them up in the fo'c's'le for their meals, and gave them their first Bull Durham in six weeks.

Kobe and Yokohama; there again the same story of swinging booms and rising dust, but a look into the deep holds now saw cargo in wicker and straw and bamboo, for we were loading aboard the merchandise of the Orient—bound home!

In mid-ocean, and again on the morning of our entry into Honolulu, the master took the bridge while the chief mate, with the second, third and fourth mates, each with his quartermaster, made a sudden descent upon the steerage passengers in search of opium. All hands were tumbled unceremoniously out of their bunks, where they lay seemingly for days, and having been forced to unlock all trunks, suitcases and other containers, were driven up the ladders to the weather decks. The heads of the ladders guarded, a wholesale assault on private property took place. Mattresses and pillows were turned and hammered for hidden contents; upside down for bags and suitcases; down to the bottom of trunks—while soft, distressed eyes in brown faces peered apprehensively down from the ladder tops, and viewed helplessly the disorder below. Opium pipes, yes; and scales for weighing it; a little whisky; a revolver, a dozen shells, a knife or two; but no opium. A most innocent-looking cargo, and yet perhaps—

> For ways that are dark
> And tricks that are vain ....

To avoid the difficulties of the customs inspectors at the docks, the prospective importer of opium into Honolulu had a habit of heaving his cargo overboard outside the harbor, with something bound in the package to make it buoyant. The waters are full of Japanese fishermen, and the identity of the steamer and point of discharge having been arranged beforehand, the fisherman confederate is on the package like a hawk, and off again quickly to his peaceful occupation.

To guard against this arrangement, a watch was placed below as we neared the land to see that nothing went out the ports, and the mates and quartermasters off watch herded the steerage people away from the rails on the weather deck, and let them watch the scenery from the middle of the ship. Fishermen clustered thickly in our path, and appeared to close expectantly into our wake, but nothing occurred to justify an impression that any successful transfer of property had taken place.

Like a true sailor, there was somebody in Honolulu I wanted to see, and I got paid off there. I left the ship with a renewed sense of familiarity with these men, having made their acquaintance as an A.B. in a previous voyage in the Atlantic, during the seamen's strike of 1919.

There are many ex-Navy men among the merchant crews, and the usual leaven of wharf rats, on one trip and off another. As usual, the men from the black gang seem preferable to those on deck. I suppose the intelligence required by their labor makes them so; the demand upon their caution made by pressures which must not be exceeded, their familiarity with valves and pipe lines, and their acquaintance with the instruments of measurement. But among them all, down from somewhere in the salty antecedents of seagoing people, a respect for promptness and thoroughness in essential things has come down to hold them even in this age of impudence and inattention, and I never saw a man come late to his watch. He might come early, and stand beside you on the deck, but with the stroke of the bell he put his hand upon the wheel, and you were relieved.

Food galore, and of the finest quality. No midshipman on a cruise would ever dream of the luxury of these laborers of the sea, and many wardrooms have poorer fare. A Chinaman to serve it, to clean the table, to wash the dishes; and a clean ice box, full of jam and butter and cheese and cold meat, stood open day and night. There was hot coffee, sugar and canned milk without limit, and fresh bread always in the bread box. The ship supplied a mattress and a pillow, a pillow case, two sheets, and two blankets, with a clean shift once a week; all the hardy voyager requires nowadays in order to go on his cruise of the world is a pair of trousers, a shirt, and two willing hands.

Two Recently Developed Acoustic Depth Sounders

By LIEUTENANT (J.G.) L. P. DELSASSO, *U.S.N.R.*

AS A result of the exhaustive experiments on under-water sound conducted during the war, although primarily relating to the detection of submarines, many useful peace-time applications have developed. Among these are numbered the various means of utilizing under-water sound for determining ocean depths. Sounding methods may be divided into two classes: those that depend on determining the direction of a reflected sound from the bottom; and those that depend on measuring the time of transit of a sound pulse from a ship to the bottom and back.

In this article it is intended to review the work conducted during the past few years at the University of California at Los Angeles, with the coöperation of the Bureau of Engineering, on an instrument utilizing the second principle, i.e., utilizing the time of transit of a sound pulse from the ship to the bottom and back.

Due to the exhaustive work of such investigators as Behm in Germany, Langevin in France, and Dr. H. C. Hayes of the U. S. Naval Research Laboratory, instruments had been developed by 1923 that made it possible to chart large areas in a small fraction of the time previously required. These instruments were not, however, direct reading. An investigation was therefore undertaken at the University of California at Los Angeles early in 1923 to determine the practicability of developing a continuously recording depth sounder.

Permission was obtained in 1924 from the Bureau of Engineering and the commander in chief of the Battle Fleet to obtain oscillographic records of the echoes received from a standard Navy oscillator over various depths and over different bottom conditions. These tests were carried out aboard the U.S.S. *Maryland* during a full-power run in November, 1924. It was found from these tests that although the intensity of the reflected sound varied within wide limits, in most cases the echo was well distinguished from the background of ship's noise. These results were encouraging for they showed that it would be possible to amplify the returning echoes.

It was felt that a depth recorder to be of the greatest use should embody the following features: it should be capable of giving continuous visual indications automatically, i.e., it should be direct reading and as independent as possible of the personality of the operator; it should be as rugged and free from adjustments as possible. In a word, it should be "seagoing," and capable of being maintained by the ever-changing personnel of a ship.

An experimental instrument embodying these features was then built and tried out aboard the U.S.S. *Maryland* in January, 1925. This instrument is known as the "graphic acoustic sounder." It is an instrument designed to use the standard Navy installation of oscillator and microphones to give a continuous graphic record of the depth and at the same time provide a visual indication. It depends for its operation upon a measurement of the time that elapses between the arrival of a pulse of sound direct from the oscillator and of the same pulse as an echo from the bottom. It is assumed that for practical purposes the velocity of sound is constant and that the speed of the ship is slow in comparison to this velocity. The time lag of the echo may be computed as follows: if

d = the distance from oscillator to microphone center in fathoms.

h = the depth of water below oscillator microphone line in fathoms.

V = the velocity of sound in sea water in fathoms per second.
t = the time lag of the echo over the direct sound in seconds.

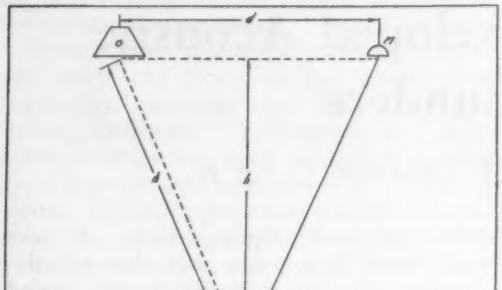


FIG. 1

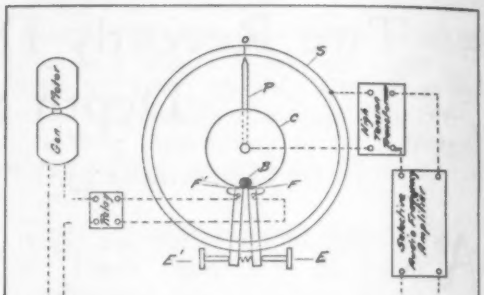


FIG. 2

Then the distance the echo travels is given by:

$$2\sqrt{h^2+\left(\frac{d}{2}\right)^2} \qquad (1)$$

This distance less d is the difference between the echo path and the direct path.

$$2\sqrt{h^2+\left(\frac{d}{2}\right)^2}-d \qquad (2)$$

Dividing (2) by the velocity V gives the interval of time between the arrival of a single pulse of sound by a direct path and an echo path; t then is given by:

$$t=\frac{1}{V}\left[2\sqrt{h^2+\left(\frac{d}{2}\right)^2}-d\right] \qquad (3)$$

It is evident that for a given depth, separation of microphones and oscillator, and velocity of sound, the value of t may be found. The graphic acoustic sounder is then merely a device for indicating or recording this time interval to an appropriate scale.

Description and Operation of the Sounder

The sounder consists of the following parts: (a) a constant-speed, electrically governed motor; (b) suitable gears to drive a rotating pointer; (c) a three-stage audio frequency amplifier and appropriate step-up transformer. The relation of these parts to the standard oscillator and microphones is shown in Fig. 2. The operation of the sounder is as follows: the pointer, P, in Fig. 2 is driven at a constant speed by the motor. Once for each revolution of P and contact disc, C, the contact bar, B, is caused to pass between the contact brushes, F and F', closing the relay circuit and then the oscillator circuit for a very short interval of time. A pulse of sound is thus emitted each revolution of the contact disc, C. This pulse of sound reaches the microphones by two routes, a direct one along the bottom of the ship and a reflected one from the ocean floor. Each of these is received by the microphones, amplified, stepped up through the transformer, and causes a short series of sparks to pass between the sharp pointer P, and the circular knife edge, S. The angular relation between the contact brushes, and F and F' and the pointer, P, is so adjusted by means of the tangent screws, E and E', as to cause the first train of sparks to begin when the pointer, P, is at the zero position on the scale. The second series of sparks, which is caused by the echo, will begin after an interval of time which is determined by the depth. This interval is measured from the beginning of the first series of sparks to the beginning of the second series. Since the pointer moves with constant angular velocity it will have rotated through an angle θ during this time given by:

$$\theta=\frac{360t}{p} \qquad (4)$$

where θ is in degrees and p is the time for one revolution of the pointer in seconds. Or substituting for t from equation (3):

$$\theta=\frac{360}{pV}\left[2\sqrt{h^2+\left(\frac{d}{2}\right)^2}-d\right] \qquad (5)$$

From these conditions it is evident that the scale can be calibrated directly in depth for any given angular velocity. It is further evident from this equation that the scale will not be quite uniform for shallow depths but will rapidly become so as the depth increases.

In the graphic acoustic sounder the pointer is arranged to rotate at three different speeds, once a second for depths below 100 fathoms, once in 10 seconds for depths up to 1,000 fathoms, and once in 50 seconds for depths above 1,000 fathoms; p then has the values 1, 10, and 50. The relation between angle and depth for $p=1$, and $V=800$ fathoms per second, now simplifies to:

$$\theta=\frac{9}{20}\left[2\sqrt{h^2+\left(\frac{d}{2}\right)^2}-d\right] \qquad (6)$$

where h and d are expressed in fathoms and θ is in degrees. If d is small for a depth of 100 fathoms it is evident that θ will be 90°.

To provide a continuous graphic record a paper chart is drawn by clockwork between the knife edge, S, and the pointer, P. Each series of sparks perforates the moving paper and provides a permanent record of depth against time.

The Constant-Speed Motor Governor

Since the device depends for its operation on the pointer moving with constant angular velocity, an electrical governor has been provided which maintains the speed within narrow limits. Under normal fluctuations of the supply voltage the speed is maintained within 1 per cent of the correct value and even with a drop of 50 per cent in the line voltage the speed does not drop more than 1½ per cent. The operation of the governor is as follows: in Fig. 3 A is the armature and F the shunt field of a 110-volt D.C. motor. The contact, D, and the friction ring, B, are attached to the same support. D is arranged

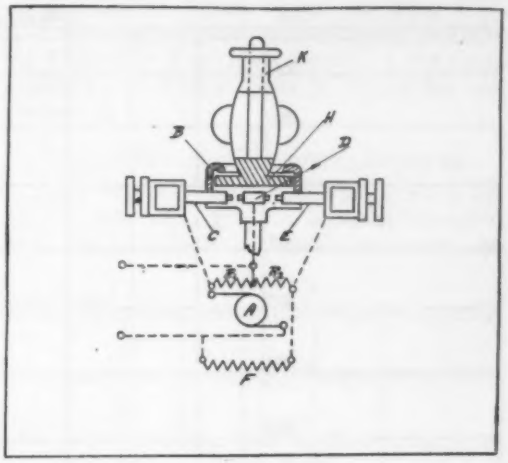


Fig. 3

so that it may vibrate between the contacts C and E. When the motor is not running, contacts C and D are held together by a light spring not shown in the figure. A resistance R_1 in series with the armature is shunted by contacts C and D. A resistance R_2 in series with the shunt field is shunted by contacts D and E. When the motor is started the governor balls are driven out radially by the centrifugal force, causing the friction disc, H, to approach the friction ring, B. If in proper adjustment the disc, H, will bear on the ring, B, with sufficient force to cause B to rotate slightly and separate the contacts C and D. This action includes resistance R_1 in the armature circuit, which decreases the armature current and consequently the torque, and tends to decrease the speed. Should the speed, however, further increase, the contact D is driven over until it closes with contact E. This action cuts out the resistance R_2 from the shunt field circuit, thus strengthening the field and further tending to slow the motor. When operating normally contact D vibrates between C and E and maintains a uniform speed. An adjustment nut K is provided to regulate the speed at which the motor is to operate. A reed tachometer is provided as a ready check on the motor speed. The reeds are actuated by a small bar magnet fixed to the motor shaft. The center reed is tuned to exactly 30 vibrations per second, the right one 1 per cent above this value, and the left one 1 per cent below. By this arrangement it is possible to check

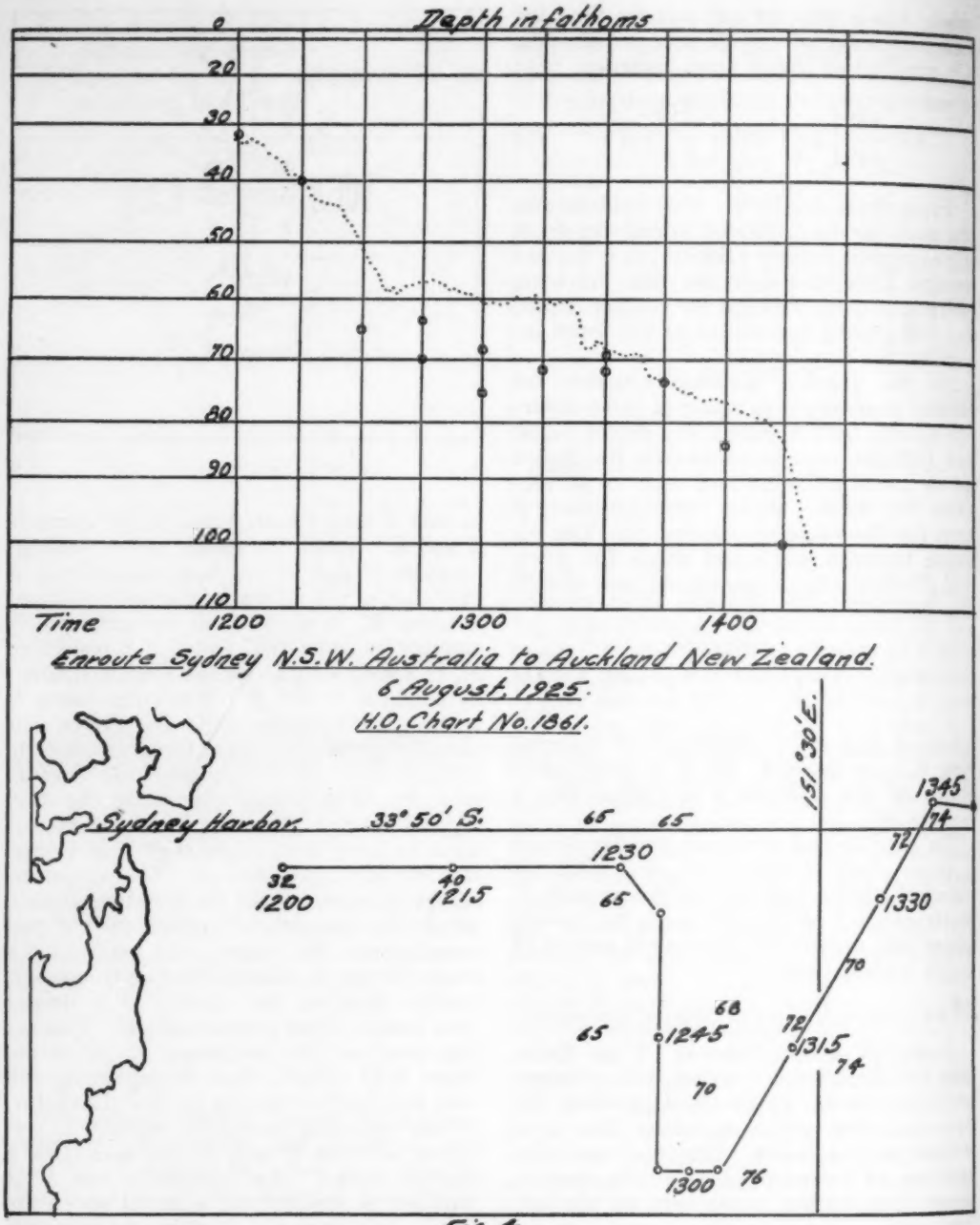


Fig. 4.

the speed at a glance prior to obtaining a sounding.

Performance of the Graphic Acoustic Sounder

An exhaustive test of the experimental instrument was authorized by the Bureau of Engineering during the Australian cruise of the fleet in 1925. The instrument was installed aboard the U.S.S. *Maryland* during passage from Honolulu, T.H., to Sydney, Australia. The first graphic record taken upon leaving Sydney Harbor en route to Auckland, New Zealand, is reproduced in

Fig. 4. The nearest charted soundings have been inserted as circles. At 1200, 1215, and 1345 the ship passed directly over charted depths at which times it is seen that the agreement is good. At 1418, the depth having exceeded 100 fathoms, the pointer speed was changed from $p = 1$ to $p = 10$. Fig. 5 shows a continuation of the record to this new scale. By 1630 the depth had reached 1,000 fathoms, at which time the scale was again changed to $p = 50$. Records similar to these were obtained upon entering and leaving Auckland, New Zealand; upon passing over submerged peaks in the vicinity of Samoa; and upon entering and leaving Honolulu Harbor, T. H.

At the conclusion of the Australian cruise in 1925, this instrument was transferred to the U.S.S. *Eagle 35*. Lieutenant Commander A. N. Offley, at that time captain of *Eagle 35*, continued the experimental work with this instrument. In an article in the United States Naval Institute PROCEEDINGS for March, 1929, under the title of "Modern Fog Navigation," Lieutenant Commander Offley gives in detail his experiences.

THE INDICATING ACOUSTIC SOUNDER

As a result of the experimental data obtained from the graphic acoustic sounder, and the criticisms of naval personnel, an indicating acoustic sounder was designed. It was felt that the graphic feature would find its greatest use for charting purposes, and that for purely navigational use an indicating instrument would suffice. An instrument of this type was built aboard the U.S.S. *Holland* in December, 1926. It has been in constant use since then.

In this instrument two speeds are provided. The pointer can rotate clockwise once a second, or in the reverse direction once in ten seconds. This arrangement per-

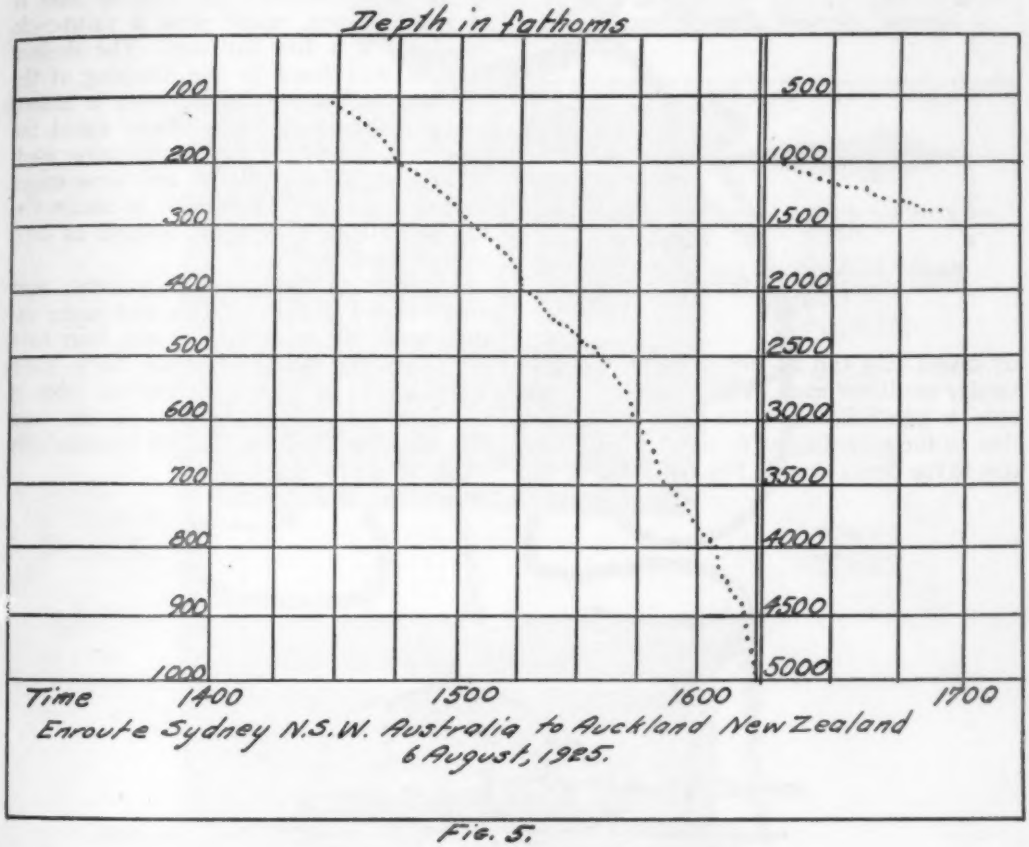
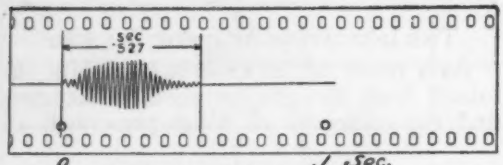
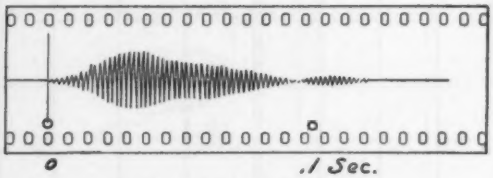


Fig. 5.

mits depths up to 400 fathoms to be read from one scale and up to 4,000 fathoms on the other. The shallow limit of both sounders is fixed by the minimum duration



a Current through Oscillator.

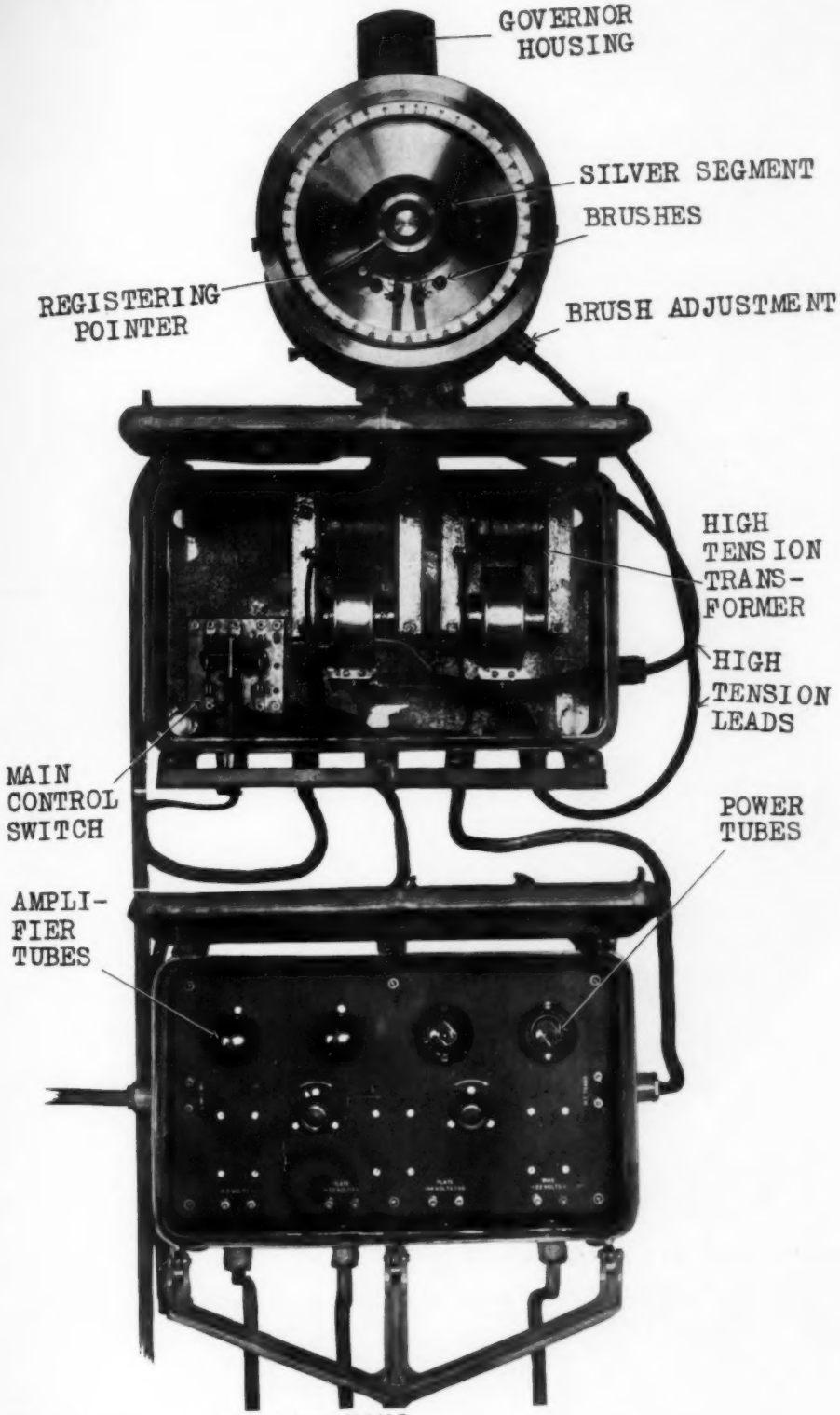


b Direct Sound from Oscillator.

Fig. 6.

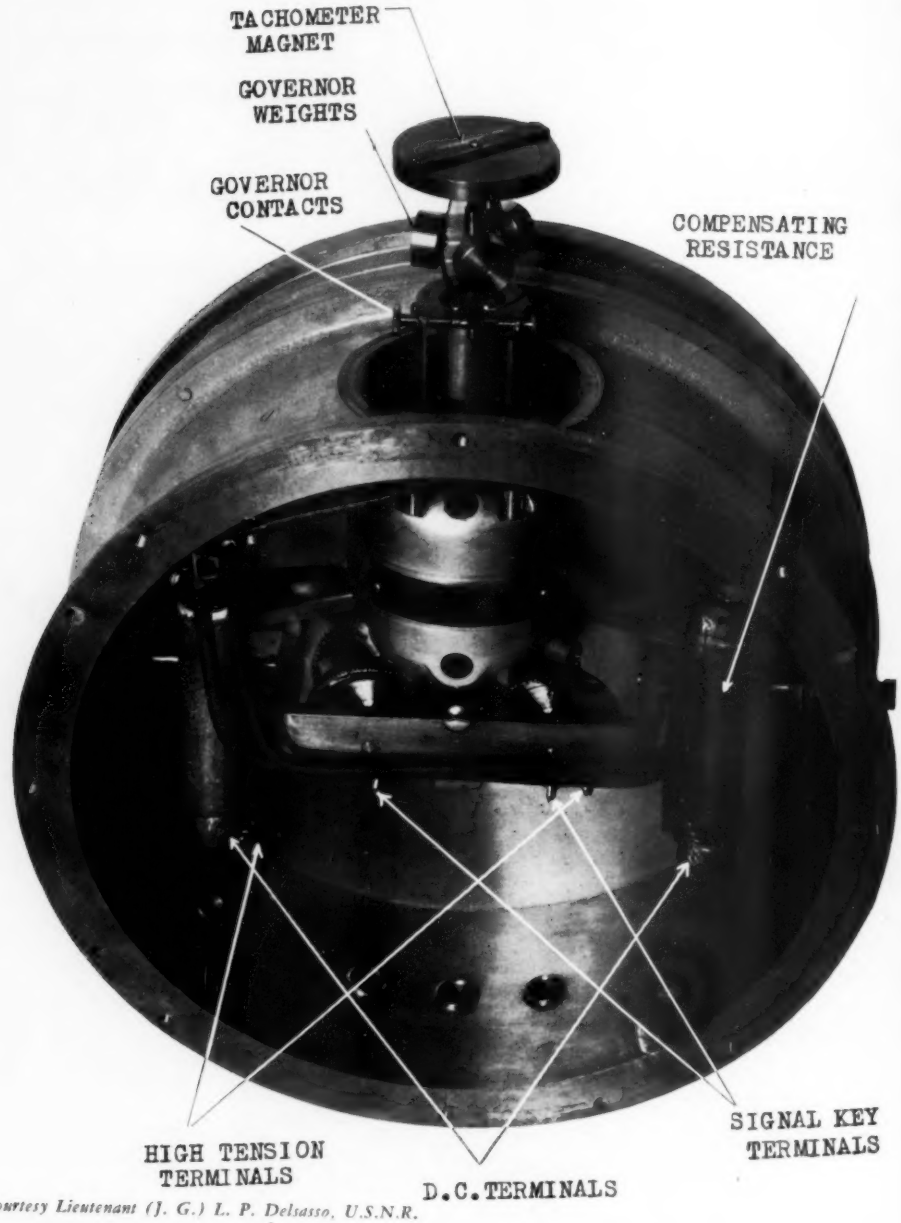
of sound that can be produced by the particular oscillator used. The least depth readable is reached when the train of sparks due to the echo begins to overlap with that due to the direct sound. Fig. 6 illustrates this point: *a* is an oscillogram of the current flowing through the oscillator when the circuit is closed for a very short interval; *b* is a record of the direct sound from the oscillator as received by the microphones. It should be noticed that the sound persists in this type of oscillator for a considerable time. It is possible, however, by using the directional property of the compensator, to eliminate some of the interference. With a 540-cycle oscillator the shallow limit is twenty fathoms, while with a 1,050-cycle oscillator it is five fathoms. The shallow limit is thus fixed by the damping of the oscillator. The maximum depth is limited by the intensity of the oscillator signal, the type of bottom, and the amplification used. With a 540-cycle oscillator and three stages of amplification it is possible to obtain visual indications or graphic records as deep as 2500 fathoms.

In order to test these instruments over an extended period of time and under actual operating conditions at sea, four have been built by the Washington Navy Yard. They are to be placed on various types of naval vessels. The results of the tests should definitely establish the practicability of these instruments.



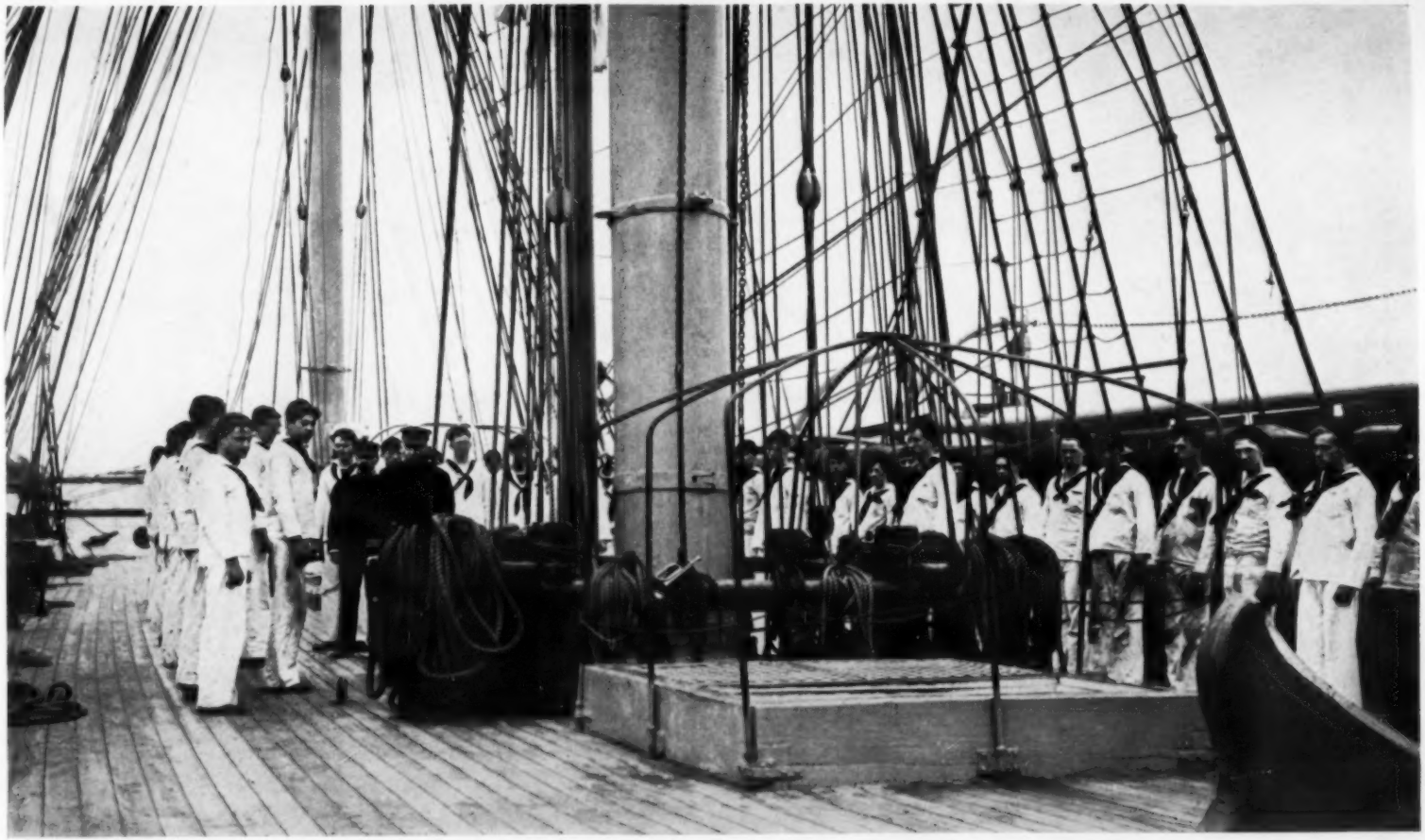
Courtesy Lieutenant (J. G.) L. P. Delsasso, U.S.N.R.

THE INDICATING ACOUSTIC SOUNDER (FRONT VIEW)



Courtesy Lieutenant (J. G.) L. P. Delsasso, U.S.N.R.

THE INDICATING ACOUSTIC SOUNDER (REAR VIEW)



Courtesy Lewis L. Smith

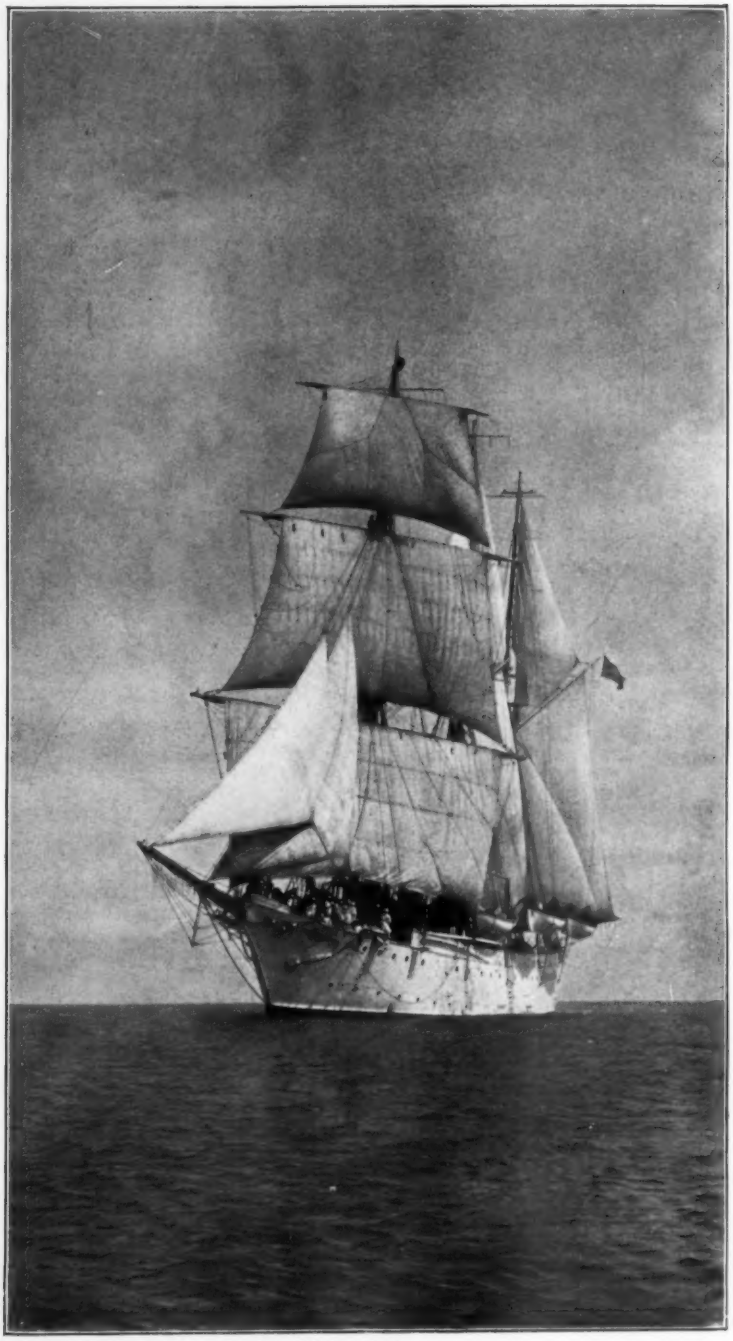
"ALL HANDS TO MUSTER" ABOARD THE *ST. MARY'S*

Courtesy Lewis L. Smith

SAIL DRILL ABOARD THE TRAINING SHIP *ST. MARY'S*

Courtesy Lieutenant Commander A. M. Tode, U.S.N.R.

SMALL ARMS DRILL ABOARD THE TRAINING SHIP *NEWPORT*



Courtesy New York State Merchant Marine Academy

TRAINING SHIP *NEWPORT*

The New York State Merchant Marine Academy

By Lieutenant Commander Arthur M. Tode, *U.S.N.R.*

THE future of the American merchant marine appears brighter than it has in many decades. Together with the increased activities of the American shipyards and the slow, but certain, revival of American shipping in the ports of the world, comes the demand for competent and trained personnel qualified to carry on the heritage of America on the seas. In this connection there was a special significance in the act of the legislature of the state of New York whereby, on July 1, 1929, there was created the New York State Merchant Marine Academy. This institution is the successor of the New York State Nautical School established in 1913, which, in turn, was the successor of the New York Nautical School founded more than half a century ago.

With a view to extending still further to American youth the field of useful employment, efforts were made soon after the close of the Civil War and about the time when American shipping was at its zenith to establish nautical schools, by means of which boys might be prepared for the important duties of the sailor and be given as much scholastic, in conjunction with nautical, education as would enable them to enter the American merchant marine under the most favorable auspices.

Prominent members of the Chamber of Commerce and the Board of Marine Underwriters of the City of New York, as well as many citizens deeply concerned in the shipping interests of this port, had for a number of years sought for the establishment of such a school. For advice on the subject of organizing the school the committee applied to Admiral J. L. Worden, U. S. Navy, superintendent of the Naval Academy at Annapolis. At his suggestion, Captain S. B. Luce, U. S. Navy, an officer who had made a special study of the subject of educating and training seamen in this and foreign countries and who from his high professional attainments was particularly fitted for the work, was requested by the committee to advise and consult with them.

As a result of researches into the history and experience of similar schools and careful discussion of various phases by the committee, it was decided that the proper place for a nautical school was on board ship. The Board of Education of the city of New York was authorized by the act of the legislature to apply to the United States government for the use of a vessel for this purpose. To extend aid and encouragement to an undertaking of such great national importance, Congress in an act approved June 2, 1874, authorized the use of certain of our national vessels for this purpose:

> Be it enacted, etc., That the Secretary of the Navy, to promote nautical education is hereby authorized and empowered to furnish, upon the application of a governor of a state, a suitable vessel of the Navy, with all her apparel, charts, books, and instruments of navigation, provided the same can be spared without detriment to the naval service, to be used for the benefit of any nautical school, or school or college having a nautical branch, established at each or any of the ports of New York, Boston, Philadelphia, Baltimore, and San Francisco, upon the condition that there shall be maintained at such ports a school or a branch of a school for the instruction of youths in navigation, seamanship, marine engineering, and all matters pertaining to the proper construction, equipment, and sailing of vessels, or any particular branch thereof, and the President of the United States is hereby authorized when, in his opinion, the same can be done without detriment to the public service, to detail proper officers of the Navy as superintendent of, or instructors in, such schools; provided that if any such vessels shall be discontinued, or the good of the naval service shall require, such vessels shall immediately be restored to the Secretary of the Navy, and the officers so detailed recalled; and provided further, that no person shall be sentenced to, or received at such schools as a punishment or commutation of punishment for crime.

Under this act, on an application made by John A. Dix, governor of the state of New York, for a suitable vessel for the port of New York to be used for a nautical school, the Navy Department kindly extended to the commission the use of the U.S.S. *St. Mary's,* and detailed Commander Robert L. Phythian, U. S. Navy, as superintendent. Lieutenant Commander George H. Wadleigh, U. S. Navy, was detailed as executive officer, Lieutenant George W. De Long, U. S. Navy, and Lieutenant William H. Jaques, U. S. Navy, as instructors, and Daniel C. Burleigh, A.P.A., surgeon and instructor. The office of Mr. David Wetmore (chairman of the Executive Committee on Nautical Schools of the Board of Education) was opened at 146 Grand Street, New York City.

The full-rigged sloop of war *St. Mary's,* named for the first colonial settlement in Maryland, had a length of 149 feet 3 inches; beam 37 feet 4 inches; hold 16 feet 6 inches; tonnage 766; original battery twenty guns. Commissioned in 1844, she had cruised with the Home Squadron (Gulf of Mexico), and had seen active service in the Mexican War, taking part in the capture of Tampico on November 14, 1846, later bringing to the United States trophies captured from the Mexicans. From 1848 to 1873 the *St. Mary's* was attached to the Pacific and Asiatic Squadrons. On September 27, 1860, her sailors and marines coöperated with the forces aboard the H.B.M.S. *Clio,* in quelling insurrections at Panama. The city of Panama was turned over to this force by the governor of Panama for their joint occupancy. On June 3, 1873, upon arriving at Norfolk, Virginia, from San Francisco, the vessel was put out of commision, and laid up in ordinary.

With the exception of her guns, the commissioners of the New York Nautical School received the *St. Mary's* from the Navy Department with substantially the same fittings as pertained to her when she was in active naval service. It was no small task undertaken by Commander Robert L. Phythian, U. S. Navy, when he assumed command of the *St. Mary's* as the training ship for the Nautical School. The position required the exercise of rare qualities. To the academic knowledge of the school teacher had to be added the firmness of the disciplinarian. For a number of years the summer cruises of the vessel, extending from May to October, were made in Long Island Sound, and in after years the cruises were extended to Europe.

The niche occupied by the *St. Mary's* in the annals of nautical education is as secure as that of the U.S.S. *Constellation* and other famous ships attached to the United States Naval Academy upon whose decks were trained great naval heroes of America. Gone forever are those scenes which are indelibly impressed upon the memories of the men who served on these ships; scenes with masses of sun-kissed canvas swelling goldenly in rustling, piled pyramids of power, of green water under a graceful bow, the harping and straining of taut rigging, the fretful drum-drum of idle reef points; of cycloramas, in which appear great banks of cumulus clouds overhead reflecting in their own radiance the whiteness of the sails towering every mast and spar.

The *St. Mary's* did duty as a training ship until 1908 when she was condemned for further service and sold to a junk firm in Boston who stripped her of all valuable appurtenances. Then passing the way of so many other famous American windjammers, she was towed to her final resting place, there permitted to rot awhile, a relic of her by-gone glories, and burned on the Isle of Pines, a victim to commercialism. Thus do we, in America, the richest country in the world, dispose of our historical relics. The U.S.S. *Constitution* has been doomed to ignominious junking numerous times, always being saved at the last moment by popular subscription. English ports are filled with their grand old ships—from the three-tier square-riggers of Armada days to veterans of Trafalgar.

And yet, while the *St. Mary's* has been but a mass of charred timbers and scattered ashes these twenty years, while the wharves at which she touched have crumbled and rotted with decay, while the harbors she entered and which proudly welcomed her as home have been filling with silt and eel grass, the ship continues to live on in the hearts and in the tender memories of the men who worked and lived on board of her, who loved her while they cursed her with an enduring devotion that the bitterness of travail could never wholly quench. The angry Atlantic waves which the *St. Mary's,* the *Constitution,* the *Constellation,* and other ships of their days, propelled by their fairy-like fabrics, proudly conquered, or when the odds against them were too strong, to which they surren-

dered like weary Amazons overborne by the fret and battle of unceasing hostility, these same Atlantic waves are today viewed but indifferently from the fuselage of a hurling airplane which traverses more distance in an hour than these ships often logged in a day.

After the passing of the *St. Mary's*, a more modern gunboat was secured. This was the composite steel and wood barkentine *Newport*, which is at present doing duty as the New York Merchant Marine training ship. The U.S.S. *Newport* is a vessel of 1,010 tons, and has been better adapted for a school ship than its predecessor because her combined sail and steam power has permitted additional instruction in marine engineering and electricity. This feature has been most important. The age of the full-rigged ship laboring under royals and stuns'ls has passed. The day of the *Flying Cloud* and the *Dreadnaught* type of ship is over. There is no more locking the topsail halyards, no more sending sailors aloft in freezing weather to feed the gilded horse at the main truck with a wisp of hay, no more routing men out at the three-o'clock-in-the-morning bell to send spars up and keeping them working until eight o'clock at night sending spars down. In those bygone days of seafarers only too often did the men become disgusted and were often forced over the side and ashore without pay to be logged as deserters.

The New York Nautical School continued under the direction of the New York City Board of Education from 1874 to 1913. In the latter year the city of New York definitely decided to abolish the institution, but through the efforts of a strong alumni association and many friends of the school, Governor Sulzer on May 2, 1913, signed the McKee Bill, providing $100,000 per year for the maintenance and government of a state nautical school, characterizing it as one of the most important legislative enactments of a decade. And now, on July 1, 1929, the third and culminating step in the history of these institutions has taken place with the formal opening of the New York State Merchant Marine Academy.

It is the firm intention of those interested to develop the New York State Merchant Marine Academy along advanced lines not contemplated at present by any similar institution in the United States. The maritime interests in the port of New York, the New York State Department of Education, and the Alumni Association of the New York Nautical School, are equally determined to advance the aims and ideals of the New York State Merchant Marine Academy and to lend their every support to the expansion of the institution in its important work.

The arguments in favor of a training ship for developing worth-while seamen and efficient officers are many. The day is past when a young man can learn the sea profession properly by shipping on board a merchant vessel in any subordinate capacity he is able to secure. Without a foundation of seamanship to start with, he remains handicapped for years, simply because the conditions under which past generations of seamen learned their craft are no longer available. Since sailing ships went out of vogue the young man with an itch for sea life has little means of acquiring the rudiments of seamanship before taking up work on board a merchant vessel. Conditions on our modern ships being what they are, the green hand often knows little beyond the details of the particular job he is given to perform; he is frequently as ignorant of the fundamentals of working a ship as any artisan ashore. In an emergency he is likely to prove as helpless as a passenger. Intelligence and training are the twin essentials of success at sea, and if the young man has the former the New York State Merchant Marine Academy can supply the latter. In the Merchant Marine Academy provision is wisely made for the young man who desires to follow the sea either as a deck officer or as an engineer officer. It is possible for him to obtain a well-rounded nautical education in a systematic and intelligent manner, under good shipboard conditions and under instructors who are men of the highest standing in the United States Navy and the American merchant service. Among the officers who have commanded the New York training ships have been Captain H. M. Dombaugh, U. S. Navy, Commander G. C. Hanus, U. S. Navy, Lieutenant Commander L. H. Everhart, U. S. Navy, Lieutenant Commander J. S. Baylis, U. S. Coast Guard, Captain E. V. W. Keen, U. S. Naval Reserve, and Lieutenant Commander Thos. W. Sheridan, U. S. Naval Reserve. The present superintendent of the New York State Merchant Marine Academy and commanding officer of the training ship *Newport* is Captain J. H. Tomb, U. S. Navy (Retired).

At this time there are two major problems confronting the New York State Merchant Marine Academy: a new training ship is urgently required to supplant the present *Newport*, while of equal importance is the necessity of securing a suitable shore base for the Merchant Marine Academy. The *Newport*, not originally built for the work it has so successfully been engaged in for the past twenty years, must soon be replaced by a vessel constructed and powered along lines of modern marine architecture and engineering. A request has been made by Governor Franklin D. Roosevelt to the Navy Department for the construction of a training ship on board which the cadets may receive instruction in the use, operation, and maintenance of equipment and machinery modern in every respect. Such a vessel, it is expected, would follow the general lines, size, and displacement of the U.S.S. *Cumberland*, which has a length of 176 feet 5 inches on water line, breadth 45 feet 8 inches, draft 16 feet 5 inches, and is of 1,800 tons displacement. This new training ship should preferably be a bark-rigged vessel with double topsails and double topgallant sails. It should be powered by twin-screw Diesel-electric engines, while the auxiliary machinery should be well diversified, typical merchant marine apparatus, receiving steam from oil-burning Scotch and water-tube boilers. A well-equipped machine shop and electrical work shop are essential. Gyro-compass, radio direction finder, telemotor steering gear, electric depth finder, and other modern machinery and equipment found on the ships of the new American merchant marine, must be included. One cargo hatch should be provided with portable cargo booms and deck winches. This type of vessel should provide accommodations for two hundred cadets, together with quarters for officers and necessary crew. It is confidently expected that the Navy Department, which has always shown the keenest interest and has always assisted the Nautical School, will view favorably the request of Governor Roosevelt and that without undue loss of time a modern training ship following the lines described above will be attached to the Merchant Marine Academy of the state of New York.

A controversial question debated by hundreds of school-ship graduates and many shipowners and operators concerns the type of vessel most suitable for a training ship. Many ask: "Why sails on a modern training ship; why not a cargo-carrying vessel which will earn its keep?" It is obvious that a ship to accommodate two hundred cadets plus officers and crew, must have suitable quarters for its complement. Should this be attempted on a cargo carrier, the vessel would of necessity be of unduly large size. Not only is this idea impractical from a commercial viewpoint, but also from the educational viewpoint of those persons who have had intimate contact with nautical training and its institutions. It is true that the navies of the world no longer train their midshipmen on vessels propelled by canvas, but it is also a fact that the maritime nations supporting merchant marine school ships employ vessels using sails plus modern propulsion machinery. And why? The necessity for keeping merchant marine training ships at sea during a cruise for practical experience in seamanship, navigation, and engineering (plus scholastic studies), makes the question of speed secondary and of economy primary. By the use of sail as auxiliary power there is gained not only greater economy in fuel and allied expenses, but the daily sail drills provide excellent and absolutely necessary physical training to the cadet personnel. These cadets, between the years of seventeen and twenty, are at an age when their proper physical development is of extreme importance, a feature impossible of attainment on a cargo-carrying, mechanically propelled vessel. The scrambling over the rigging, the work aloft, the romance of a sailing ship smacks not only of a heritage of the sea, which is permeated deeply into these youths, but the self-reliance and alertness it develops, the more intricate problems in navigation which result, the more expert seamanship which is required, makes sail power as an auxiliary adjunct the logical choice for a training ship.

The second important problem concerning the Merchant Marine Academy is the necessity for a permanent base and adequate provision for the conduct of the regular scholastic and academic work while the ship is in port. At the present time this is limited to the classroom schooner *Guilford D. Pendleton*, which is moored alongside the schoolship *Newport* at Bedloe's Island, New York City. For over half a century the New York schoolship has literally been kicked about from pillar to post; it has been shifted

from dock to dock, and from one recreation pier to another, occupying space by the courtesy of the Army, the Navy, or the city authorities, and without expense to the state. Several locations for a permanent base have been considered where this amphibian school may keep itself associated with the state supporting it. More specifically, what is desired is a land area of forty or fifty acres, fronting on water with a depth of eighteen feet at low water. This tract so situated should be close to New York and in Long Island Sound. The most promising site in the immediate vicinity of New York City, combining the other features so essential to the welfare of the Merchant Marine Academy, is a portion of the Fort Schuyler reservation. This is, of course, controlled by the Army, but it is hoped that that branch of our national defense will view favorably allocating a portion of the Fort Schuyler reservation to the new academy in accordance with a request recently made by Governor Roosevelt. This location, besides offering proper dormitory, class-room, gymnasium and other athletic facilities, combines other features essential to the successful conduct of the Merchant Marine Academy, which are: (1) quick communication to New York piers to enable cadets to visit ships for practical instruction in stowing or discharging all types of cargo (heavy, fragile, mixed, steel, case goods, oil, grain, coal, etc.) both from the viewpoint of safety and security of cargo, and safety and stability of ship; also for practical instruction in ship repair yards, manufacturing plants, and the study of all types of modern machinery on board ships; (2) practicability of taking the training ship into the Sound by the cadets for short periods to gain experience in handling the ship, in docking and undocking, in man-overboard drill, and in navigating in shoal waters along shore; (3) advantage of enabling the cadets to obtain frequent small-boat exercise under oars and sails to become expert in handling such craft. The Fort Schuyler site would also enable the construction of a necessary ship and boat basin without initial dredging and without continued dredging operations to maintain a deep-water approach.

We are standing upon the threshold of a greatly intensified era of activity in American shipping. The nation as a whole is rapidly assuming that greatly desired attitude which has been aptly termed "ship-mindedness." Once more we are looking toward the sea as a means of expanding our trade and commerce. Fifty years ago, and even twenty-five years ago, if a young man wanted to satisfy his longing for a seafaring life it was necessary—except in a few cases where apprentices were available—to offer his services as a cabin boy or ordinary seaman and take his place in the forecastle. Under the rough and ready conditions of earlier days he obtained a knowledge of navigation as best he could and his nautical education depended upon the instruction he might receive from the officer under whom he served. The square-rigged sailing vessel, the school in which many of our best seamen were trained in the past, has disappeared, and if the race of virile seamen whose skill and courage have done so much for the prosperity of the country is to be perpetuated, it can only be done at the present time by the auxiliary training ship.

Every educational institution stamps its graduates with the impress of its own individuality. A West Pointer, or an Annapolis graduate, can be picked from any group of men because these academies represent a certain type of training. In like manner the New York State Merchant Marine Academy gives a similar training, not to be found in any other educational institution in the state. The willingness of the graduates of the Nautical School to engage in hazardous undertakings is indicative of the idealism emphasized in their training.

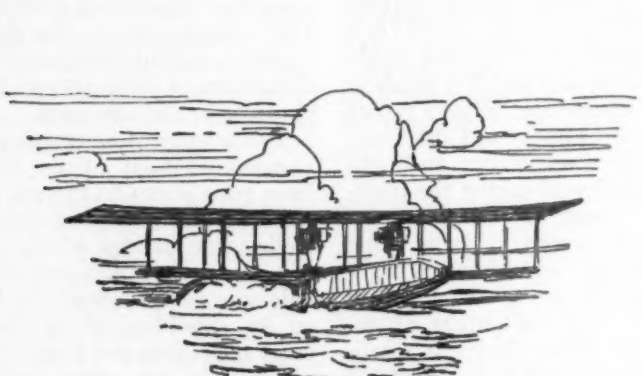
The science of navigation is almost as old as mankind itself. From earliest times men have gone down to the sea in ships. Navigation, like industry and commerce, has made tremendous strides within the past quarter of a century. It is a profession not only requiring a varied knowledge but it also places on the shoulders of its officers a responsibility over lives and property that is seldom equalled in any other walk in life. This means that the men who command and officer American ships must be properly trained in the growing science of navigation and engineering which is every year becoming more exacting. The New York State Merchant Marine Academy will keep pace with these demands, in like manner as the United States Naval Academy keeps pace with the advancements in naval construction, gunnery, etc., and will train American youth, who, as rep-

resentative citizens, will find their way to every port in the world. They, together with the graduates of Annapolis, are the unofficial ambassadors of the United States and it is from them that the people in the far countries of the earth secure their impressions of America.

All properly directed efforts to re-create the American merchant marine and to restore it to the high plane it held so long presuppose the existence of sources for the training of modern officers needed. Our preëminence in the days of sail was the product of methods wasteful sometimes, and always rough, but methods best suited to the environment. Since the substitution of motive power for canvas, other conditions have entered and it is now agreed that those conditions are most usefully satisfied by preliminary education on board seagoing training ships. The need for such training as the New York State Merchant Marine Academy offers is widely recognized, especially by the officers of our merchant vessels who have to contend with some of the misfits who turn to the sea for a livelihood when every other chance ashore has gone.

During the fifty-five years since the establishing of the New York Nautical School, now the New York State Merchant Marine Academy, nearly four thousand young men have been enrolled and trained for a sea career, and of this number more than fifteen hundred have graduated with credit. Many of the graduates served in the Spanish-American War, and during the World War over 300 saw service with the United States Navy and in the United States Naval Reserve Force, while other hundreds served in the merchant marine. Numerous graduates of the *St. Mary's,* and of the *Newport,* are also graduates of the United States Naval Academy and of the United States Coast Guard Academy and are at present in these great branches of our national defense.

The Empire State has the responsibility for the training of young men who are destined to become the leaders in all vocations, both professional and nonprofessional. It is almost a truism that progress in all fields depends on leaders backed by training. It is particularly fitting that the great state of New York should provide in the New York State Merchant Marine Academy a means for the training of future executives, operators, and officers for American shipping because of the fact that the commerce of the United States, in a large measure, flows through the port of New York, now acknowledged to be the greatest port in the world.



The Construction *and* Repair Department *of a* Battleship

By Lieutenant Commander Davis De Treville, *U. S. Navy*

OF ALL the departments into which the organization of a battleship falls, the Construction and Repair Department is unique. It might be taken as a matter of course that it is a workable organization on a par with the other departments, and is as standardized as the others. In practice as found on different ships, such is far from the case, and it is interesting to investigate this condition and see how it operates.

The Evolution of the Department

The Construction and Repair Department dates from only about eighteen years ago and is therefore the newest of all except Communications, which in fact is so new that its legs will hardly bear its weight. In the memory of practically every head of department afloat, the job of keeping the ship clean and free from corrosion was attended to by the second in command of the ship, who was called the first lieutenant. As ships grew larger, requiring bigger complements, and as paper work began to evidence the enormous proportions it would eventually reach, it was recognized that the second in command was loaded down with more than he could efficiently handle. The solution to this problem was to create the title of executive officer for the second in command, and to fill the job of first lieutenant with a lieutenant commander next in rank on the ship to the executive, who could relieve that officer of the inspection of double bottoms, the issuing of paint, the chipping of chain, and such details, while the executive could find more leisure to handle personnel in all its ramifications and act as coördinator for the various departments. That he was thought to have more time under this arrangement is shown by the fact that he was made chief fire-control officer, and many of us can remember him sitting on top of the conning tower (there was no fire-control tower then) wearing a JA phone, and hoping the battle would take place in calm weather not too hot.

About this time (1912) the general storekeeping (GSK) system was put into effect. Naval stores and equipage were put down in minute detail in Paymaster Hicks' book (Standard Stock Catalog); bureau cognizance became of vast importance afloat; custody receipts infected us to such an extent that turret officers must needs sign for the 12-inch guns for which they were responsible; accountability for materials reached an awful pitch. Tools were Title B, and a shipfitter who hit his finger and let both hammer and chisel go overboard no sooner had the injured digit bound up than he was made the subject of a grilling hardly less searching than the Spanish Inquisition at its best, or worst. Torpedoes then were Bliss Leavitts. The starting mechanism was put in motion by a knife cutting off the top of a little copper nipple about the size and shape of a capsule for quinine. That little capsule was Title B and every time a torpedo was fired, at least one survey had to be held to account for one little capsule. The loss of the entire torpedo (about $6,000 then) called for no more paper work than the cutting of one starting nipple. In those days the Construction and Repair Department took on the complexion it now wears, and with the head of it senior to all other heads of departments, it was far more of a department than it has ever been since. It was a power in itself by virtue of the rank of its head and by reason of the fact that gunnery was in its infancy and engineering had nothing outside the B and C subdivisions of the ship.

When the 1913 Navy Regulations appeared, the organization of the Construction and Repair Department and the duties of

the first lieutenant were given a few pages, much as they are today except for the rank of the first lieutenant. A comparison of these paragraphs with those laying down the duties of the executive will show a striking similarity. Nine-tenths of the duties of the first lieutenant are also prescribed for the executive. The accountability of Construction and Repair material is the only personal and inalienable right of the first lieutenant. It alone is not shared with the executive. This means that no matter how clearly the regulations may define the Construction and Repair Department, its head must never forget that he is in fact the assistant to the executive for material. This was indeed the original conception of the job, and nothing that has been written or imagined about it since has changed it in its basic operation.

What the Bureau of Construction and Repair Would Like

The Bureau of Construction and Repair occasionally has other ideas for its own pet department. It has a large manual full of paint formulas, chain dimensions, boat outfits, and technical data by the thousands. It prescribes tests, routines, records, and dozens of things; and it would like to feel that its mandates are more honored in the observance than in the breach. But in many cases it elicits only the comment, "What of it?" If the immediate superior in command does not like vermillion paint, the insides of the motor-boat ventilators simply will not be painted vermillion, so the Construction and Repair Manual might just as well not prescribe it. If the senior surgeon believes pea green more soothing to the eyes of his patients, and the captain backs him up, the sick bay will be painted that color, let the manual say what it will. And the same is true in many cases. The Bureau of Construction and Repair reserves to itself the right to design a great many things for use aboard ship, but it has no personnel aboard ship to follow things up. If a thing it desires does not meet with favor, or causes inconvenience, or is not wanted, much trouble will be met in securing its adoption. The duly authorized representative of that bureau is the first lieutenant, who is a line officer with a department large in money but small in men. He can carry out the bureau's wishes only to the extent that he can secure the coöperation of the other departments in a large majority of cases. The pneumercators were designed to show at a glance the amount of fuel oil in the ship. Construction and Repair was eager to have this information, and having secured the cognizance of these instruments, spent thousands of dollars installing them. They pierced dozens of important bulkheads to run the little lines of tubing. And once they were bought and paid for, who was there to insist on their use? The oil king gets his data with a steel tape, and so far as the pneumercators are concerned, he is not interested enough to wipe the dust off them. Another case in point is the expensive humidity control installed on our heating system. How many ships use them? When the captain asks "Who looks after this?" the first lieutenant and the engineer look at each other with accusing glances, but neither dares speak. There are many such stepchildren aboard a battleship. Construction and Repair would seriously like to have its part of the ship administered along its own lines, but until it places some of its own designers afloat as members of the ships' complements it will have trouble achieving its wishes.

The First Lieutenant

We have seen how the Construction and Repair Department was born amid the thunder and lightning of the GSK system, and how its head, the first lieutenant, like Caesar, was all powerful. He was, as they say, the "big noise." Before many years, about two in fact, his importance had waned. From the senior head of department he was dropped to the junior. The navigator's billet was soon found to be far more desirable with its gentlemanly leisure in port and its pleasantly interesting work at sea. The Bureau of Ordnance about that time had expanded its personnel to the extent that it was able to place a fairly senior officer in the gunnery billet. The engineer officer was always fairly high up. The big noise became a little squeak, and there were times to come when he was hardly a whisper. Nowadays the authority of the first lieutenant borders on the mythical. He may speak with the tongues of men and of angels but verily it is as sounding brass or

a tinkling cymbal unless behind his words is the charity of the captain's nod.

The First Lieutenant and the Captain

The biggest single factor in the life of the first lieutenant is the personality of the captain. Only the navigator shares his grief in this respect. No battleship captains now at sea have ever been engineer officers of electric-drive installations, and only a few have first-hand knowledge of burning oil. None of our present captains has been through the mill in the gunnery game as it is played today. All of them, however, have had the first lieutenant's job and he is their meat. Whenever these two departments make it too hot for the "old man," he can always send for the first lieutenant and tell him to cover up that red lead. No need for the answer to be, "But, Captain, that red lead was put on only this morning, and the Construction and Repair Manual says it should stand at least twenty-four hours." You may quote from every book including the Bible, but if the "old man" has made up his mind to have it covered up, you will end by covering it up. The first lieutenant's first thought should be, not how to get his work done as he thinks it should be done, but how to saddle the captain's hobbies so he can ride them to his heart's content. You may take it as an axiom that every captain has several hobbies along the lines of taking care of a ship, and once those are provided for, you will have so much more time to spend on your own pet schemes. If you have stolen a half hour to go down to A-128 and help the boatswain decide how to stow those 18-inch blocks he stole from the yard last year, and the captain's orderly finds you after five minutes as he surely does, being no less than a bloodhound where you are concerned, you may take it for granted that you would not have to go up five decks and aft four hundred feet if you hadn't neglected one of the "old man's" hobbies. Practically every captain will let the chief engineer deliver the turns and never think of telling him where to put his back pressure. He will also let the gunnery officer open fire without telling him he ought to put on a larger hot-gun correction. But very few captains are content to tell the first lieutenant to keep the ship clean and let it go at that. Most of them will hark back to the halcyon days when they had the job and will suggest methods they used with success. And you know what a suggestion from the captain amounts to. If these come at you too hot and heavy, don't let it worry you. It's his ship, and you're only working in it.

If the captain does annoy the first lieutenant at times, nevertheless he is the best assistant the first lieutenant has. No ship is so easy to keep clean as one in which the captain makes frequent inspections. In the height of training for short-range battle practice, you may rub a division officer's nose in a dirty corner in his part of the ship, and although he has looked in that direction, he hasn't seen it nor has he heard a word you said. Where you saw dirt he saw an "E." But if that dirty corner is mentioned in despatches after Saturday morning's battle, hits or no hits it gets cleaned up. Division officers can frequently present alibis which are half convincing to the first lieutenant, but which earn no clemency when the captain comes around. When the captain announces that he would like to look at certain compartments your worries in that direction will soon be over, for if they aren't ready then, they will be shortly after he has seen them. So, while every one on the ship is supposed to help the first lieutenant do his job, no one is such a help as the captain.

The First Lieutenant and the Executive

Between the captain and the rest of the ship stands the executive officer. Or rather sits, for that individual is so buried in paper work these days that a large part of his time is spent at a desk. The turnover in personnel in a battleship is astounding. Receipts of drafts, expirations of enlistments, transfers to Naval Reserve, changes of ratings, and such events occur frequently and the papers involved in such cases require from four to thirty signatures. Maybe the captain signs or maybe he can "pass the buck" to the executive, but the latter has to initial in one case and sign in the other, and there's little difference. To this volume of papers we must add the special requests and hundreds of other things that come up daily in a crew of over a thousand. When a certain admiral hoisted his flag as commander in chief, Battle Fleet, after a tour as commander, Battleship Divisions, he called a conference of captains and heads of

departments. Among other things he said he was going to chase the executives out of their swivel chairs and send them up on deck to take a hand in overseeing the ship. That was two years ago and they are still at their desks for the greater part of the day, and some of the night, if the navigator misses the hole and the ship has to shift anchorage. This busy man is the first lieutenant's first aid in time of trouble. He is the one to go to when you don't see how in the world a thing is to be done. What with stores coming on board Thursday, and the turrets having to be painted, and those blankety-blank aviators wanting to catapult, and a barge of Diesel oil coming alongside on Friday morning and gasoline Friday afternoon and an official smoker Friday night, how are you going to get ready for admiral's inspection by Saturday morning, when it's already Wednesday night? These executives nowadays answer a question like that without stopping the pen or taking their noses out of the papers. And the answer is always what you need to clear the atmosphere, so that Saturday morning finds the chief of staff quite affable, and the admiral ready to call it a day before he's reached the second deck. When certain orders come through from the cabin and you are rebelling inwardly at the unreasonableness of things and you are saying to yourself that you will never make another cruise on one of these pig-iron battle wagons, where a man can't call his soul his own, the executive will generally find a way of showing you the necessity for those orders and you gradually realize that had you been running the show you would have done the same thing only more so. I don't mean he feels that way himself. He may have exactly your point of view, and sympathize with you deeply. But his job is to carry out the captain's doctrine and being a good executive he has learned to do that very thing and make you like it. He's a big help to you in lots of ways. When your handful of artificers has been depleted to the point where the plumbing is getting ahead of you, he will generally make the gunnery officer jar loose from a couple of strikers for you. Lean on him. Keep him informed of what's going on under the cognizance of the Bureau of Construction and Repair. The regulations hang most of your job on him, but since he's too busy to get around to it personally he can back you up best when you keep him up to the minute with the news.

The First Lieutenant and the Gunnery Officer

Now we're about to touch on the real mission of the ship—the business of dropping salvoes on a target at the earliest moment. The gunnery officer is the gentleman charged with the preparation of the battery for battle and is therefore the boss of all the drills pertaining thereto. There is only one deck force. The same men shoot the guns and clean the ship. Since shooting is the prime requisite the gunnery officer gets first call on the time available for working these men. Indeed, on days when they have flight quarters at sun-up, battle stations all day, and Condition Two at night, you wonder if he hasn't first and last call. Your relations with him must be most friendly, for the best results are accomplished by the closest coöperation between your department and his. You will soon see that this state is achieved when you let him have all he asks for and content yourself with what is left. In other words you put yourself psychologically in resonance with the situation. You know he will get it anyway, and it's diplomacy to yield gracefully. In return he will occasionally dismiss his lower handling-room crews early while the pointers are check-sighting so they can come on the topside instead of lying around the third deck dirtying up the paintwork. There won't be any petty officers or division officers with them because they're still in the turret. So you'll have to put them to work yourself, but something will be accomplished; whereas had your relations been less cordial the whole division might have been kept in confinement until eleven-thirty. And sometimes at quarters, when he has the division officers lined up, he will let you harangue them before they return to their parades. What you have to say is vitally important. It concerns hatch coamings and angle irons that have to be scrubbed before Saturday. Before he has given you a whack at them he has filled them so full of what he wants covered at drill that morning, that your speech spills over and is lost before they get half-way back to their divisions; and the boots who do the scrubbing

don't get the news until afternoon rolls around and you tell them yourself. But even so, he's got you in mind and later on in the year when most of the practices have been fired you'll find him ready to turn over the men to you for whole days at a time. Short-range battle is the worst period of all. Not only is he working all the deck force, but you'll notice that most of the job orders you've issued for your three little gangs are for gadgets for use in the Gunnery Department. He has sent a scout over to the *Maine* to investigate the improved 5-inch loading tray they have developed over there. The report is to the effect that the tray has chopped off a half second from the loading time for a string of four. Result: shipfitters drop everything and make twelve loading trays as per sketch, required by Wednesday night. Your carpenter's gang is making funny little plotting boards to be used at this practice and thrown overboard soon thereafter. Your painters are mixing up the queer shades of pink, orange, and brown the broadside battery hopes to find traces of on the screens when the shooting is over. In the meantime the holes in bulkheads throughout the ship increase in numbers; the daily losses in boat beading get out of reach; and the quarter-deck cork rings no longer spell the name of the ship in their accustomed neatness. All because of short-range battle. Once this is over all hands breathe more easily. The tension is gone out of the ship. The score was not as high as the gunnery officer hoped for (it never is). But a few "E's" appear here and there, and best of all, the guns' crews take on a different attitude. Short-range battle is to the gunnery year what football is to the college athletic year. It comes first and is the most exciting. The whole ship's company is keyed up much as a student body is over football. When any turret or group is firing everybody not on watch is on deck with hearts pounding against ribs, with the same feeling you have in the stands when your "varsity" plays its traditional rival. Once Thanksgiving is past you can watch the rest of the sports on the calendar and rarely get worked up even mildly. After short-range battle the crew steadies down and you find you can get them involved in a bit of ship's work with very little trouble.

The First Lieutenant and the Engineer Officer

Nine-tenths of the trouble the first lieutenant has comes from the Engineer's Department. I mean real, soul-searing trouble, the kind that makes you bow your head in speechless grief. Have you ever seen a fuel-oil hose carry away outboard and spray its load over a freshly painted side? Are there words in any language capable of meeting such a situation? Have you seen a quarter-deck sprinkled with the products of combustion by the action of blowing tubes with the wind ahead? Have you seen a ship's decks after they've been scrubbed down with the deck hoses running a mixture of oil and water, caused by the auxiliary watch "accidentally" cracking the bilge suction on the manifold? Have you ever tried to make a neat stowage of twenty drums of lubricating oil (excess quantity, ordered by mistake), anywhere on any deck with each one leaking at both bungs in the heat of the tropics? When the tongues of men were confounded at the Tower of Babel, it is said to have been an awful sound. But these old Scripture writers had never heard a deck force division when its part of the ship had just been treated to one of these engineering accidents.

Such occurences are rare, fortunately, but they do not tell the whole story. If the engineer officer happens to be that type who is making engineering his career and has always had shore duty under that bureau and sea duty in that department, and consequently can't see the ship through the cloud of steam, the first lieutenant's troubles are ever present. Harmony is made more difficult by an anomaly in the fundamental organization of the Navy Department. The Bureau of Construction and Repair in Noah's time designed the anchor windlass, the pumps, and the steering gear for the U.S.S. *Ark*. Notwithstanding the subsequent invention of machinery and the creation of the Bureau of Engineering, the Bureau of Construction and Repair continues to design such appurtenances and a great many more in use on board ship, all of which are engines in every sense of the word, and require the same talent and care as do the main propulsion units. Now Construction and Repair, while jealously preserving its traditions and retaining its cog-

nizance over certain pieces of machinery, realized that it had no personnel afloat to take care of that machinery. Its representative aboard ship, the first lieutenant, has a corporal's guard of artificers, who do very well with plumbing, sheet metal, a little plate and angle work, small screw-thread work, and such, but who know nothing about lining up shafting, scraping in bearings, adjusting clearances, and other machinist qualifications. So it wisely omitted any reference to machinery when it wrote up the duties of the first lieutenant for the Navy Regulations. In order that its machines should not go wholly uncared for it caused to be inserted under the duties of the engineer officer the following pertinent sentence: "He shall also be charged with the maintenance and care of all steering engines, capstan engines, winches, and other power-driven auxiliaries, under the cognizance of the Bureau of Construction and Repair." The Navy Regulations are analogous to the Constitution in that they require some sort of enforcing statutes to carry out their provisions. Aboard ship these statutes take the form of the Ship's Organization Book by means of which the captain has put the breath of life into the regulations as they apply to his command. In the preparation of this book that narrow-minded engineering officer has taken a hand, as have also you; but being senior to you and a more convincing talker he has succeeded in having his interpretation of the regulations accepted. He has taken the attitude that the words "maintenance and care" in the pertinent sentence above mean "You run 'em until they break down, and I'll fix 'em." He won't lift a finger to prevent their breaking down, by having his machinists look 'em over now and then to see if they are properly lined up, adjusted, and lubricated. He carries his argument that they are Construction and Repair and therefore yours, and they go in the book under you. Some of them he won't even touch when they are out of order. Take boat cranes, for instance. They are electrically driven, and in order to prevent too much juice being used in their operation, which would affect his score, he has insisted on having a rated electrician at the controller. When this electrician forgets himself and two-blocks the hook, thereby cracking some of the rollers in the sheave bearings, it's your little gang that works all night getting the crane in commission again. Take the submersible pumps, for another instance. They are electric and by regulations he is charged with their upkeep, although Construction and Repair cognizance. You ask for one to pump out D-324, flooded by the wardroom showers. He has one electrician accompany your four men who lug the pump aft and lower it in place. His man turns on the switch and the pump burns out its windings. The explanation is that his end of the pump was O.K., but your end let the water reach the motor through a loose gasket. Look at the battles that take place on the subject of fresh water. This commodity is manufactured by the engineer officers, but is dispensed from Construction and Repair tanks by Construction and Repair pumps through Construction and Repair pipes and measured by Construction and Repair meters. He is vitally interested in it because it affects his score indirectly. The operation of the fresh-water hold has been bandied back and forth between you and him for years, and on any ship taken at random it's a toss up as to which department has it. A long while ago some one set an arbitrary figure of ten gallons per capita as a reasonable water consumption on a battleship. The average is well over thirteen, but no matter; he still has hopes of pulling it down to ten and he makes your life miserable with his implications that you aren't standing by the spigot to see that no man gets more than half a bucket at any one time.

He's a mighty opponent, this engineer officer. His performance is reflected in the ship's standing in battle efficiency and Form H is a formidable weapon, which he can and does use frequently. You need not be surprised at any crimes committed in the name of economy as laid down in the engineering "computation." The old practice of putting 25-watt lamps in all fixtures and turning out most of these so that the ship is in a state of gloom is not looked on with favor nowadays, but he has other tricks in his bag. He sometimes goes so far as to convince the "old man" that frequent use of boat cranes is losing the white "E", and to succeed in getting an order issued that all boats will remain in the water until 1630. And you may believe it or not, on one occasion when the ship was to be illuminated at

1900 and a boat happened to be on the crane at that time, the engineer duty officer induced the officer of the deck to refrain from striking six bells until the boat could be landed in the skids to avoid having to start another generator. He was a lineal descendant of Joshua.

Maybe you are lucky and are shipmates with an engineer officer of another type—one who has had other kinds of duty, one who is a naval officer first and engineer after that. "What a grand and glorious feeling." You don't write any formal chits such as "The captain noted a leaky steam flange at frame 40 main deck starboard side." Instead, you stick your head in the log room, and say, "Hey, Chief, how's to fix that steam leak in the dentist's office. There's a hot drop hitting him in the back of the neck." Life for you is a grand sweet song so far as the black gang is concerned. When his electricians leave holes in your bulkheads, he makes them plug 'em up. When a hundred tons of NSA stores come alongside he doesn't wait for you to hoist them all on board and deliver them to the Supply Department. He sees the boiler brick and tubes he's been waiting for and has the B Division yank them through the second deck air ports. When you ask for juice on the anchor windlass you get it without submitting a request for so many kilowatt hours. In short you and the chief are buddies.

The First Lieutenant and the Other Heads of Departments

By this time you are wondering if there are any more troubles that can be heaped on your throbbing head. There are. We have only begun to fight. The supply officer is really your friend, for he keeps you in funds and helps you get an additional allotment. But he can be most exasperating in the matter of surveyed material when you want to get it out of your storeroom, and he refuses to let it clutter up his. You take a lot on the chin on account of cockroaches and those little fellows that "have no wings at all but get there just the same." This riles you sorely, because you feel that it's a matter of sanitation which the book says is the "pidgin" of the senior medico. He, however, though a contemporary of the chief of the Bureau of Medicine and Surgery, is still a commander, and is only waiting for age in grade to put an end to his misery. No help from him. The communication officer has a lot of men, but they're all on paper as far as you're concerned. You can't expect key pounders and flag wavers to scrub paint work. And so it goes in every department in the ship. Every man has a cleaning station, but he also has some other reason for being on board, and generally speaking that reason takes precedence over your work. Truly the first lieutenant works his passage.

Questions

This is going too far. No human would ever finish a cruise as first lieutenant if things were as bad as that. He would find a berth in the Red House before the first year was over. Of course it's all wrong to paint such a picture, for your job brings its thrills and rewards, just as all other jobs in the service do. There is this difference, though, between you and your fellow heads of departments, the gunnery and the engineer officers. Their labors may be crowned with material things such as pennants and "E's" and prize money with appropriate letters of commendation, while your compensation must take the more spiritual form of inward satisfaction derived from the knowledge that your work is well done. There is no score in your work; it has no weight in the battle-efficiency competition. But it's important just the same. Some one has to do it. As the end of your cruise draws near you are inclined to look back and reflect. Some of those many unpleasant things recur to you and you say to yourself, "Yes, it's work that has to be done by some means or other." And vague questions come to your mind, "Is the system really a workable one?" "Was I really doing something, or were we muddling through?" You find food for thought in those questions.

"If I Were King"

Those old words sneak up on you. You would like to take a crack at organizing things as your cruise has showed you they should be organized. You would begin way up near the top in the Navy Department by taking all machinery away from Construction and Repair and giving it to Engineering. You see in the present scheme a huge duplication of effort. Pumps are designed to throw a volume of liquid at a certain rate

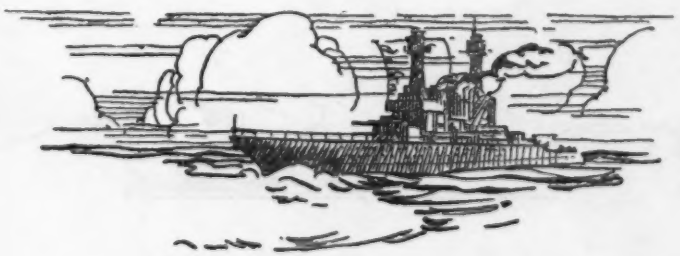
against a certain head. Why should both bureaus be designing pumps. All engines are designed to perform certain work under given conditions. Why should the machine that moves the rudder be designed by one bureau and the one that moves the propeller be designed by another. You would tell Construction and Repair to stick to its job of determining the shapes of the hull, of cutting out the plates and angles, shapes and forgings, of putting the hull together, and keeping it in the necessary state of repair and preservation during its life. You would pass along to Engineering specifications for the machinery that goes into that hull for whatever purpose, and you'd tell them to keep it running. This you will learn has been suggested many times before and lots of people will tell you it won't work. Nevertheless you want to try it, because it affects the next big shift you intend to make, which is to abolish the job you have just devoted three years of your life to.

You begin by deleting the words "first lieutenant" from the ship's organization book, wherever found. In its place you write "executive officer", "gunnery officer" or "inspection officer" as may be appropriate. For your place on the ship has been taken by a two- or two-and-a-half-stripe naval constructor, who is assistant for material to the executive, and has the title of inspection officer. Your job has been split three ways. The executive officer has also been given an assistant for personnel, who is a line officer of sufficient experience to be of real help in paper work, and the executive can get away from his desk without taking a penalty. The deck force which in your time had three bosses now has but two.

The operation of the ship goes on about like this: the executive divides the time available under the employment schedule to suit the conditions. The gunnery officer gets as much of it as he needs and the preparation of the battery for battle goes on as before. The time required for cleaning and painting is specifically set down and is given as much weight as is the gunnery training. These two things are given the major consideration as they are daily routine. Such things as emergency drills, instruction periods, locker and bedding inspections, are sandwiched in wherever desired. That part of the routine which directs the cleaning and painting is handled by the executive officer. Having been relieved of much of his paper work by his personnel assistant he has found leisure to acquire some first-hand information as to the needs of the ship in this respect and the balance is reported to him by his material aide, the construction officer, who helps him lay out the work in advance by days, weeks, and months. This inspection officer has a different status from yours when you were first lieutenant. His time is devoted exclusively to the inspection of the hull and fittings and making recommendations to the executive for their proper upkeep and repair. He inspects daily the living compartments, galleys, heads, washrooms, and spaces on the second deck and above. He sees each accessible compartment below the second deck at least once a week. His notes and records are kept in minute detail so that in laying out the work in advance, the executive is able to direct the division officers in better than general terms. The inspection officer will issue no orders but will advise the division officers as he thinks necessary. He will be able to accomplish these inspections on schedule because he will be relieved of the following duties which in your time were given to the first lieutenant: summary courts, which now are divided between the engineer officer and navigator, with the gunnery officer taking his share in slack times; landing force, which occurs in port when the navigator has plenty of leisure for it; catapulting and picking up planes, which you spent hours standing by to do, and which is now directed by the gunnery officer, who can easily do it because it always happens well before and well after the battle; the care and upkeep of machinery which used to worry you but which is now 100 per cent engineering; ship's service, which used to sneak up on you at irregular times and keep you busy for hours and days; the handling of provisions which is no strain on the gunnery officer because his men do it and he can't work them at the guns while it is going on. The deck artificers do not exist any more as such. They have been amalgamated with the machine-shop gang under the ship's repair officer much as it is handled on the repair ships. All job orders are handled through the one channel.

You look over this organization as it moves along and you find it much smoother

than the one you worked under; furthermore as new ships are built you see improvements you often wished for but could never get approved. For these later ships have been carefully gone over by people who have had to live in a ship for three years and many incongruities have been eliminated from the preliminary plans. You knew all the time that if the people who designed ships had to live in them, the wardroom pantry would never be located in the midst of and equidistant from all the choicest rooms in the ship so that the heads of departments are bombarded with the rattle and banging of crockery and silverware three times a day, to say nothing of the prattle and skylarking of mess attendants at turn-to in the morning watch. You didn't call yourself a genius when you saw that the wardroom was a two-ended affair, and the food could be introduced into it through the forward or crew's end of it as efficiently and expeditiously as from the after or officer's end of it. More so in fact because the galley is forward and the distribution point would be nearer the original source of heat. You know the captain's office would not be placed on equal but opposite footing with the executive's cabin, because the captain never goes in it, and the time required for his yeoman to travel a few additional frame spaces is no vital factor in war or peace; and its present space would make two first-class staterooms. You know that if the people who locate bunks in staterooms had to sleep in them they would place them fore and aft instead of athwartships; and their heads would not be in a corner where circulation of air is at its lowest ebb, both from the airport and the blower. You know that if the designers of aëroplane booms had to operate them they would give them sufficient strength so that the boom would not carry away before the slings on the plane; and that the guys would be given adequate power to steady a two-and-a-half-ton plane as it is being lowered into place on a rolling ship; and that the booms would have ample facilities for securing so that they do not take charge and swing forward on the run until they take up on the tripod and break off at the goose neck. You know offhand that all the galley wants from the air compressor is air, which can be delivered in a small pipe from any distance. And that the compressor would best be located in one of the machinery spaces, where it can be looked after, instead of in the third division living compartment where it is sworn at when it starts its infernal racket at all hours. You know that the post-office, canteen, and barber shop would be located amidships, instead of on each side at the entrance to the main deck where men waiting for service form an impassable barrier. Dozens of other things which annoyed you are now located and arranged in a more comfortable, efficient and logical manner.



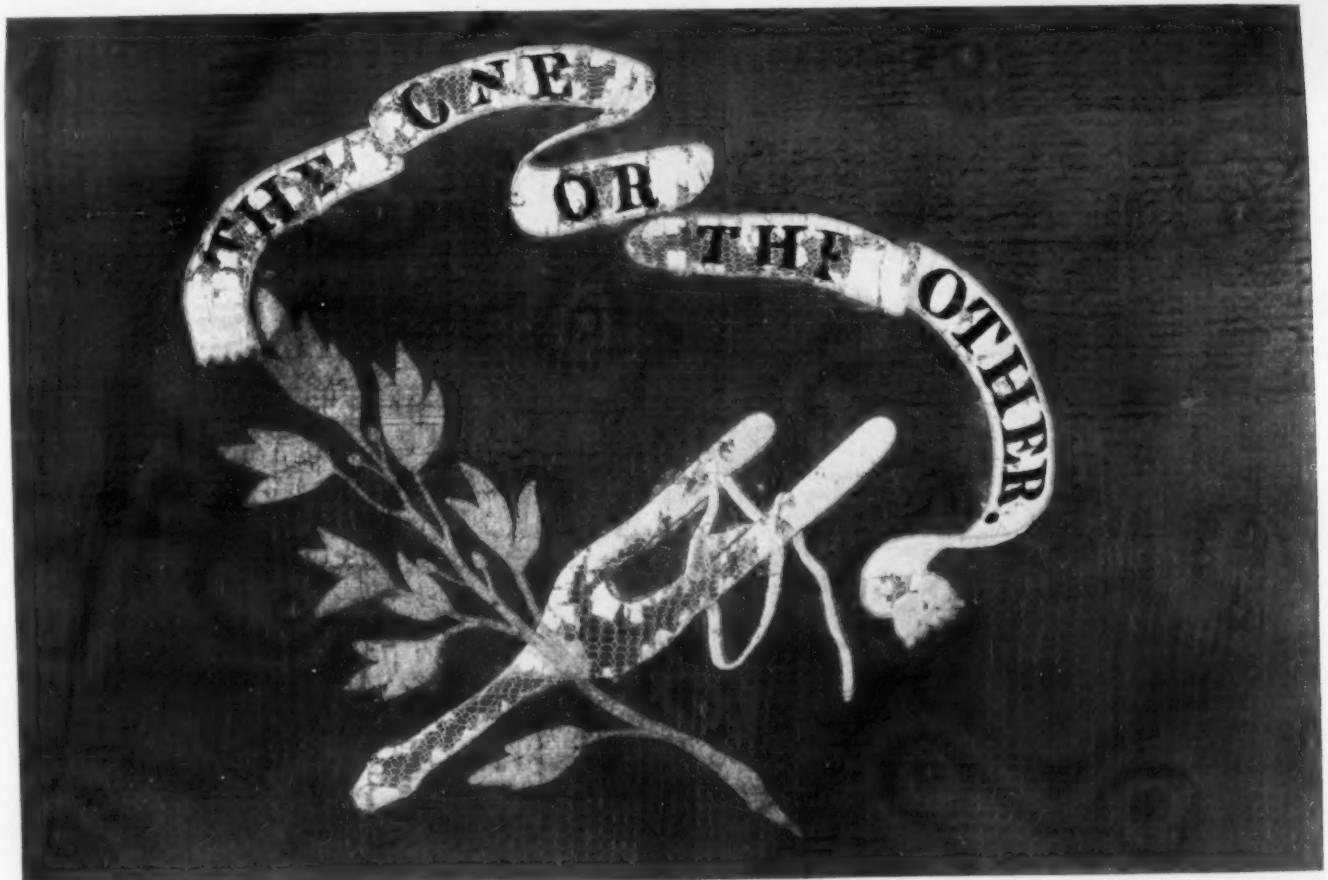
"*The* One or *the* Other"

By HERMAN F. KRAFFT

A FLAG, bearing the above legend and once flown by Commodore Stephen Decatur, has recently been presented to the Naval Academy by Mrs. William W. West, a great-great-niece of Decatur. Some years before his tragic death, Commodore Decatur had adopted his three nieces as his daughters, and through one of these, Priscilla Decatur, the flag has come down to Mrs. West and with it this sole tradition—that it had once been flown on his flagship.

The words, "The One or the Other," taken in conjunction with the olive branch and the scabbard as illustrated on page XLI of this issue, refer undoubtedly to Decatur's punitive campaigns against the Barbary corsairs in 1815. For this expedition, authorized immediately after the War of 1812, Decatur was assigned a powerful squadron to exact summary punishment from Algiers and other pirates, who under cover of the recent war had seized American ships and cargoes and were holding American citizens for ransom. Decatur, who had had much experience with these treacherous corsairs during the Tripolitan War ten years earlier, brought word on his arrival in Algiers of his capture, a few days before, of two of their warships and the death of their admiral. He insisted that the treaty he presented be ratified without change or delay on penalty of the destruction of all Algerian shipping. The Bey hastily signed the treaty. Shortly after Decatur gave Tunis and Tripoli, for similar recent depredations, the same choice between peace or war, the olive branch or the sword, and in each case with like results.

Less than six months after leaving home waters, Decatur was back in the United States. Always a good deal of a popular hero, he was again the lion at banquets and the subject of toasts. To one of these toasts, "The Mediterranean—the sea, not more of Greek and Roman, than of American glory," he gave his now famous response, "Our Country, right or wrong." On these occasions, in addition to honors of all sorts heaped upon him by his fellow citizens, he was the recipient of various gifts. It seems altogether probable that the Decatur flag, which now hangs in the auditorium in the Naval Academy, was presented to him by some group of American admirers after his triumphal return from the Mediterranean in 1815.



Courtesy U. S. Naval Academy

A FLAG FLOWN A CENTURY AGO BY COMMODORE STEPHEN DECATUR

The words, "The One or the Other," and the olive branch and scabbard refer to Decatur's summary methods with the Barbary pirates in 1815. Presented to the Naval Academy by Mrs. Wm. W. West, great-great-niece of Decatur.

International News Photos, Inc.

THE SUPERMARINE ROLLS-ROYCE *S-6*

British entry in this year's Schneider cup races, when a speed of more than 328 miles per hour was made. Three days later (September 10) this plane made a speed in excess of 355 miles per hour. On September 12, a speed of 357.7 was attained.

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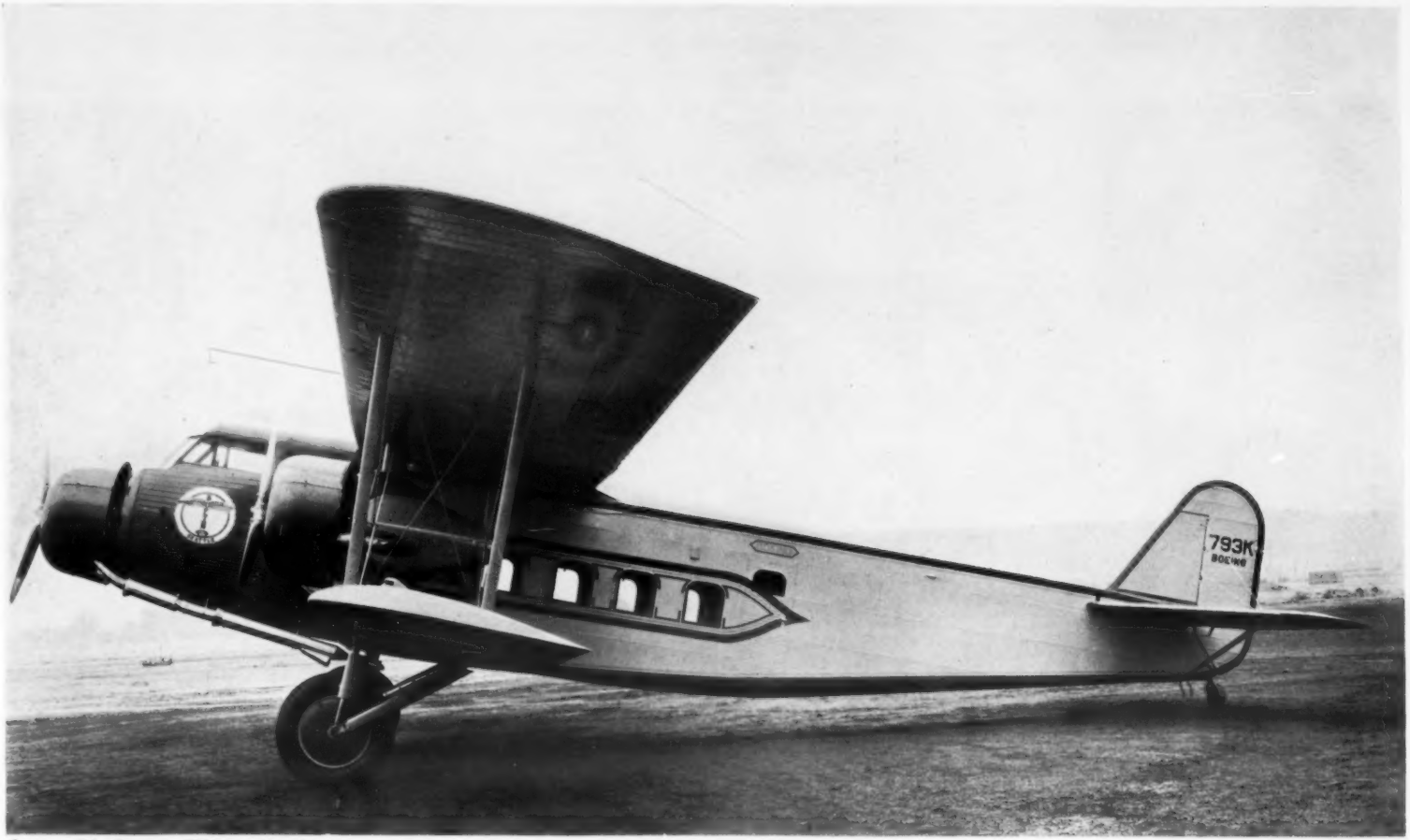
International News Photos, Inc.

NAVY ASSEMBLES PLANE BELIEVED LARGEST IN THE UNITED STATES

The huge Dornier-Superwahl seaplane is now being assembled. It has a length over all of 83 feet 11 inches, and a wing spread of 93 feet 10 inches.



Courtesy The Pratt & Whitney Aircraft Co.

BOEING 18-PASSENGER, $70,000 TRANSPORT

One of the fleet which went into the San Francisco-Chicago service in October on a 24-hour schedule. This Boeing plane powered with three 525-horsepower Pratt & Whitney "Hornet" engines on its test flight developed 135 miles an hour. It carries 18 passengers, 2 pilots, and a steward. It weighs 8½ tons when fully loaded, has a wing span of 80 feet, is 55 feet long, and 16 feet from the bottom of the wheels to the top of the fuselage. This is said to be the largest capacity plane flown on a regular schedule over an established long distance route.

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Courtesy Bureau of Aeronautics, Navy Department

IN THE WIDE OPEN SPACES

Looking up Burrough Bay on the Alaskan mainland. Mapping plane No. 2 in the foreground.

International News Photos, Inc.

THE COLONEL FLIES WITH THE NAVY

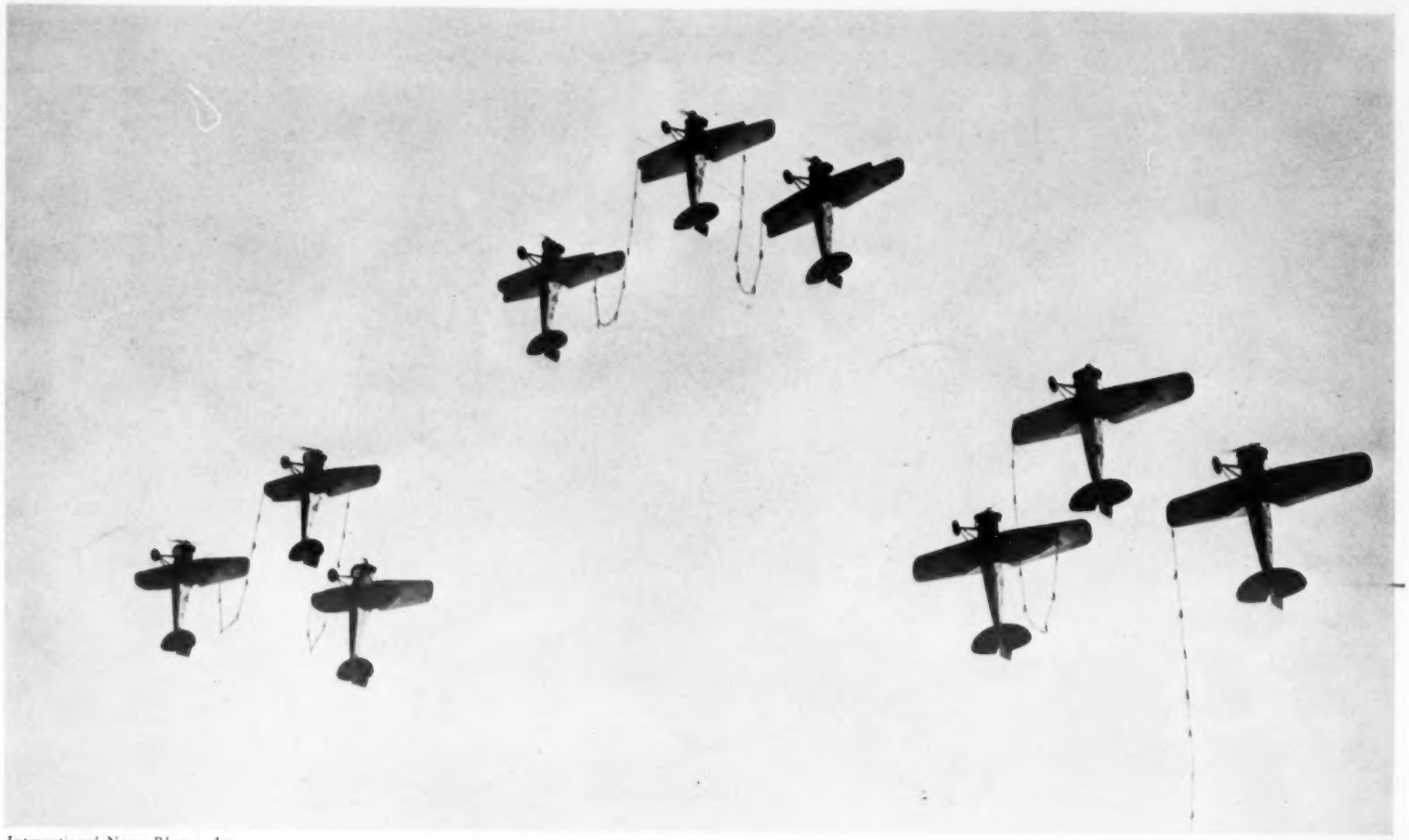
Colonel Lindbergh in a Navy plane joins Navy's "High Hat" squadron in hair-raising evolutions at the Cleveland Exposition, held late in August this year.

Colonel Lindbergh in a Navy plane joins Navy's "High Hat" squadron in hair-raising evolutions at the Cleveland Exposition, held late in August this year.

International News Photos, Inc.

NAVY "HIGH HATS" GIVE THRILLING DEMONSTRATION WITH WING TIPS TIED

The second squadron of the Navy "High Hats" flying in formation with wing tips tied by connecting cables. Flying in this manner they dived, zoomed, and made sharp turns. At the end of the unique demonstration, most of the cables re nained intact.



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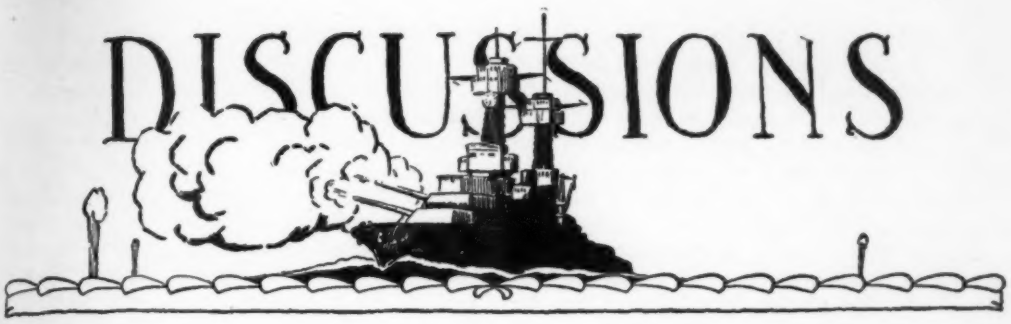
IT CAN'T BE DONE, BUT THEY DID IT!

A view showing the "High Hat" squadron, with wing tips tied to each other, giving a perfect example of team work. After going through many complicated evolutions, several of the planes were still tied together.

DISCUSSIONS



A view showing the "High Hat" squadron, with wing tips tied to each other, giving a perfect example of team work. After going through many complicated evolutions, several of the planes were still tied together.

IT CAN'T BE DONE, BUT THEY DID IT!

The Construction and Repair Department of a Battleship

(See page 965, this issue)

COMMANDER H. S. HOWARD (C.C.), *U. S. Navy.*—The paper by Lieutenant Commander De Treville is most interesting, particularly to one connected with the design of ships in the Bureau of Construction and Repair who has also watched the operations of the Construction and Repair Departments of ships of the fleet in the normal performances of their duties. Much of what is said in this article came directly to my attention while fleet constructor of the Scouting Fleet in 1925-1927, and in making comment upon this paper I have much sympathy for the troubles and aggravations which are described.

The principal part of the paper resolves itself into criticisms, first of the present organization of the Navy Department by which the Bureau of Construction and Repair designs and supplies much of the auxiliary machinery in any vessel while the Bureau of Engineering already exists and actually supplies much similar machinery as auxiliary to the main propelling plant of which it is placed in particular charge; and second, of the fact that the Bureau of Construction and Repair has no personnel on board ship directly responsible to it for the operation and care of the machinery which it provides, this machinery thereby becoming "nobody's child," as with the necessary organization on board ship the first lieutenant has only a small force of men under his direct charge to maintain and operate this machinery.

Lieutenant Commander De Treville's suggestions for the improvement of these conditions are, first, that the cognizance of all machinery on board ship be placed under the Bureau of Engineering. As an immediate corollary this machinery would then fall directly under the charge of the chief engineer and his department on board ship and the machinery would at once have the benefit of care and operation by the skilled personnel of the Engineering Department. As a second suggestion, it is proposed that each battleship or first-rate ship have a naval constructor as first lieutenant. However, in filling this position by a lieutenant commander or lieutenant naval constructor it is proposed that this new first lieutenant should no longer be a first lieutenant as known nowadays, but should become an inspection officer pure and simple, making reports to the executive officer with regard to the hull of the ship and conditions in what is now the Construction and Repair Department on the ship, but having absolutely no direct authority over any part of this department.

Taking up these questions, and first the one of general cognizance, it may be admitted at once that on first sight there seems to be an anomaly in the present arrangement by which two bureaus (or even three, if the Bureau of Ordnance be included) design and provide machinery which accomplishes the same results in different parts of a ship. However, the best practical results are not always accomplished by means which, without thorough study, appear to be the best from a purely theoretical point of view.

The design of a ship is a very complicated engineering and architectural problem and unless some one agency is charged with the whole conception, results will not be of the best. In fact, it may be said that unless one agency is responsible for the design as a whole, only very unsatisfactory results will be obtained. In a ship there is only so much

space and so much weight to allot to all the different activities and there must be a coordinating head which can balance one claim against another and sum up the total results, in order that one feature may not suffer at the expense of others, so that in the final result the end sought for may be accomplished in the best possible way.

The present division of cognizance in the design of a ship and in the furnishing of machinery has grown up partly as the result of long experience and practice, and partly as a definite decision that the present arrangement is the best. Back in the sailing-ship days before propelling machinery came into being it was natural that the steering gear and anchor gear, and any other mechanical apparatus provided, should have been designed and built by the designers and constructors. This may well have been the original basis of the cognizance now in force, but in addition, the rudder and the steering gear are intimately tied up with the form of the ship necessary for proper propulsion, while the anchor gear is as closely related to the displacement and the form of the ship as a whole. With the coming of propelling machinery, a new agency, the Bureau of Engineering, was created to design and have cognizance over the propelling machinery itself. With but little variation the dividing line then created has been maintained to the present on the basis that in this way the best and most practicable results will be obtained.

The same holds true with material under the Bureau of Ordnance. Ordnance supplies the guns and their mountings but the supplying of ammunition to the guns which is provided for by the Bureau of Construction and Repair involves the arrangement of ammunition spaces and ammunition hoists within the vessel and fitting these in with the other features of the ship. Within their own fields the Bureaus of Engineering and Ordnance carry out their engineering and ordnance designs complete, but these designs must be worked into the ship as a whole, having in mind at the same time the other results to be accomplished, and in coordinating the various claims and requirements and in supplying features auxiliary to the needs of these other bureaus, the Bureau of Construction and Repair fills a most important place.

It must be realized, too, that the auxiliary machinery supplied by the Bureau of Construction and Repair is not confined to anchor gear and steering gear, nor to pumps which may happen to be duplicates of pumps supplied by the Bureau of Engineering in connection with the main propelling machinery. The former bureau designs and provides water pumps for salt and fresh-water systems, turret-turning and other machinery, boat-handling machinery, piping systems of all kinds which must be closely related to the pumps from which they are supplied, ventilating systems, all galley and laundry machinery, and in fact a list too long to relate without boring the reader.

If all this machinery be transferred from the cognizance of the Bureau of Construction and Repair, it is not apparent as to just how this will be a panacea for all the ills of the present arrangement. As far as is known, ammunition hoists are kept in running order although the Bureau of Construction and Repair has no personnel directly responsible to it aboard ship, and similarly, galley ranges, electrical or oil, and electric bake ovens continue to run. It seems rather a sad commentary to imply that unless a design bureau has personnel over which it has life and death control, to maintain and operate its machinery aboard ship, that machinery will not get attention.

To return to the general principle expressed above, namely, that one agency must control the design as a whole. This principle has been well and definitely recognized within our own Navy Department. Following the period of the depression in the Navy after the Civil War, when a start was made with the building of the new steel Navy, it was realized that there was no directing head for the preparation of designs. Consequently in 1889 the Board on Construction was created by the Secretary of the Navy to handle all questions relating to the design and construction of ships. This board was composed of the chiefs of the various material bureaus, each one of whom had an equal voice in the discussions on questions of design. It was found that such an arrangement did not work out satisfactorily in practice and in 1894, after five years of experience with the board, the Secretary of the Navy changed that system and gave the Bureau of Construction and Repair preeminence in the design of naval ships. By this arrangement that bureau became re-

sponsible for the design, structural strength, and stability of all new vessels.

This principle holds not only in our own Navy Department but is recognized in ship design and shipbuilding throughout the world and the practice which we follow is closely paralleled universally.

With regard to the first lieutenant's job on board ship, it is realized under what difficulties he functions, but it is not believed that the suggestions made for improvement would accomplish the result sought for. The idea of having a lieutenant or lieutenant commander naval constructor as first lieutenant on each battleship or ship of first rate has something very appealing in it, and it is an idea which has been considered and discussed many times in the past. There is undoubtedly much to be gained by constructors making more frequent cruises at sea, where they have an opportunity actually to live with the ships and the machinery which is in them, for ships gain the benefit of the naval constructors' design experience on shore, and the constructors bring back to their major work of the design and maintenance of ships the broadening influence of their experience at sea. If the Construction Corps were large enough to permit this to be done, the idea might well be carried out with mutual good effect to line and Construction Corps. However one great difficulty at present stands in the way. For by regulations the naval constructor first lieutenant would have a position without military authority, and without authority he would have practically no reason for existence. In this paper of Lieutenant Commander De Treville's, it is proposed that a constructor filling this position would not even be a first lieutenant as at present recognized, but would become purely an inspection officer absolutely without authority and simply reporting the results of his inspections to the executive officer. In such a position the incumbent of this job would have no status at all. It would take a superman to retain interest in any job in which he completely lacked authority, and naval constructors are but human.

Destructive criticism alone is of very little use, but there does not seem to be much constructive suggestion which can be offered to improve the present situation greatly. Ships can only carry so many men and complements are now so large that ships tend to be overcrowded. One deck force must maintain the ship and also man the battery and the organization of the ship must provide that the work of upkeep, as well as of gunnery, carry on. It appears that it should be only a question of proper ship's organization and orders to ensure that Construction and Repair machinery shall receive proper care and operation.

If naval constructors are actually needed as first lieutenants the result of detailing them to this duty would probably result in general mutual benefit. However, if they are ever to be assigned, they should be assigned as actual first lieutenants with the necessary authority to permit them to take their place in the ship's organization, and not as pure inspection officers lacking status, control, and authority.

The Speed of Battleships

(See page 273, April, 1929, PROCEEDINGS)

LIEUTENANT COMMANDER J. W. REEVES, JR., *U. S. Navy.*—This article discusses a question of particular interest at this time. What should be the speed capacity of battleships—especially new battleships?

To make a certain speed requires the development of a certain horsepower. To develop that horsepower requires that a certain percentage of the ship's total displacement shall have been allotted to the machinery necessary for that purpose. As speed, or horsepower, is increased the amount of displacement that must be assigned to it is correspondingly increased. On a ship of limited displacement an increase of weight assigned one characteristic requires a corresponding reduction of that assigned to some other. There are many possible combinations of ship characteristics. Which combination best fulfills the needs of the United States Navy is the function of the General Board to determine. How these general characteristics may best be realized, first in plans and later in the completed ship, is, to a great extent, the task of the material bureaus of the Navy Department to work out.

Drawing up general characteristics and preliminary designs for a ship of limited displacement is like budgeting a limited income. Each item of the budget must show its cost, and the cost must be in proportion to its value. Similarly each characteristic must show what it will cost in displacement, and

the cost must be in proportion to value. If the cost is too great, the item must be reduced or entirely eliminated. In other words the preliminary estimates, and to some extent the general characteristics themselves, must take into account the factor of cost (weight).

The cost of characteristics in weight is not a fixed quantity. Greater protection can be provided today on a smaller weight of armor than was the case a few years ago. In hull construction, stronger and better structures are being provided on less weight. It is claimed that in the new German armored ship *Ersatz Preussen* a reduction in weight of hull structure of over 5 per cent has been made. Similar reductions are being made in the weight of machinery per shaft horsepower. Whereas present battleship machinery weighs about seventy-five pounds per shaft horsepower, and light cruiser and destroyer machinery thirty to forty pounds, the new German armored ship's machinery weighs, so it is claimed, only seventeen and one-half pounds. Fuel economy has likewise improved. Less fuel is required for a given cruising radius, or on the same amount of fuel a much greater distance can be traveled. The determination of general characteristics requires a consideration of the weights involved—not fifteen or twenty years ago, but today, and tomorrow.

With all of this the essay has not concerned itself. Its argument is limited to the claim that the value of speed, strategic and tactical, has been exaggerated; that the World War demonstrated this fact, and post-Jutland developments further emphasized it. It closes with the following modest assertion: "In conclusion attention is called to the shifted burden of proof. This now rests with the advocates of higher speed, since their pet theories were either exploded in the war or rendered untenable by subsequent developments." This seems to mean that the essay has furnished proof, from the World War and later developments, that the value formerly assigned to high speed in battleships (twenty-one to twenty-three knots) was overestimated and exaggerated. Consequently the speed of future battleships should be reduced.

Webster defines proof as "convincing cogency of evidence; evidence that induces or tends to induce certainty of judgment." The present writer contends that the essay has presented nothing that corresponds with that definition—even faintly. The events of the World War, taken alone, are not good evidence on the subject of the speed of battleships for the simple reason that during the war there was but one meeting between vessels of the battleship class. And that one meeting is not mentioned in the essay. Post-Jutland developments consist mostly of evidence of the need of increased protection (mainly horizontal) and the need of an increased ammunition supply. That these requirements have increased will not be denied. But it does not necessarily follow that speed has decreased in importance or that speed capacity should be reduced.

The argument of the essay contains much that has to do with other types of ships but little that bears directly upon the subject of battleships. In an argument that purports to offer definite proof of a contention it is proper to examine the evidence critically, and to discard that which is irrelevant.

In this essay the six most important advantages of superior mobility are examined in the light of what actually happened in the war and of subsequent developments. In what follows, I will state the arguments, with comments on each in turn.

(1) Speed has been claimed to be important strategically in that it enables the fleet possessing it to concentrate at a desired spot as quickly as possible. But during the war strategic speeds were determined not by the speeds of battleships but by the speeds of destroyers, which, due to poor fuel economy, were much lower. Ships of the train, if in company, would reduce speed still more. These considerations affect our Navy with more force because of the greater distances involved in our strategy.

Comment—If one type of ship has an unsatisfactory fuel endurance the obvious remedy is to improve the endurance of that type, not to sacrifice or reduce the endurance of all other types. The best of our modern destroyers are built on plans that are over fifteen years old; that is, quite antique. Hull efficiencies have improved, and can be further improved. The field of reducing hull weights is practically untouched. Thanks to competition marked improvements have been made in turbine efficiencies and in weight per shaft horsepower. While little has been done in improving propeller efficiencies, there is no doubt that there is plenty of room for it. All of this tends to reduce

machinery weight, and to increase the distance that can be traveled on a given fuel capacity.

There are many kinds of strategic concentration other than the specific case where the entire fleet, including train, troopships, and advance base equipment, engages in an overseas advance. That high speed could not be used for strategic concentration in such a case is probably true. But this is no argument against its value in numerous other situations which are just as likely to occur, and where its value is unquestioned.

Similarly concentration does not necessarily involve great distances such that economical speed must be used. The distance may be anything at all, so long as it is outside the tactical field. Even with great distances the value of time may outweigh the disadvantages of large fuel expenditures. The essay's argument on this head concerns itself with one sort of situation only, and ignores every other one.

(2) Superior speed has been claimed to give the power of forcing or refusing an action. In the late war this claim was realized but twice and then due to unusual circumstances. At the Falklands, Spee walked into a trap; at the Dogger Bank, Beatty engaged Hipper due largely to advance information. The occasions on which higher speed failed to force an action form an impressive list.

Comment—At the Falklands whether or not Spee walked into a trap does not change the fact that at the beginning of the chase the Germans were nineteen miles ahead and that, except for superior speed, they would never have been caught. Speed is not a cure-all. It cannot manufacture opportunities as well as provide a means of taking advantage of them.

Similarly at the Dogger Bank when the Germans turned toward home they were about fourteen miles away from the British. The superior speed of the latter closed the range to a point where the action could have been decisive. Speed could not be expected to do more.

The impressive list of cases where speed failed to force an action consists of the *Goeben's* escape, "due to a series of tragic blunders"; the Heligoland Bight affair where light forces were surprised and overwhelmed by superior numbers; Coronel and Jutland where no effort was made to avoid action; and December 16, 1914, and August 16, 1916, when contact was never made. These instances are similar in that in every one of them, for one reason or another, no effort was made to make use of speed for forcing or refusing action. The potentiality was there. That it was not used does not change the fact that it could have been used if wanted. It is a self-evident and demonstrable fact, either on the game board or with actual ships, that a fast force can catch a slow force, or that a fast force can escape from a slow force if it so desires. And it is not difficult to conceive of situations where this quality would be of considerable value.

(3) Superior speed has been claimed to give the tactical advantage of choosing the range. The captain of H.M.S. *Lion* is quoted to the effect that nine times in ten the weather determines the range, and that under conditions of poor visibility when one must come in to around 10,000 yards, the ship with plenty of speed but no protection finds itself in an awkward position.

Comment—The natural inference from the wording of this quotation is that 90 per cent of the time the visibility at sea precludes a range greater than around 10,000 yards. This may possibly be fairly accurate for the North Sea. For the oceans of the world it is not accurate or even approaching accuracy. If 90 per cent of the time the maximum range were 10,000 yards—or even 20,000 yards—there would be no excuse for spending money, space, and displacement in providing for 30,000- and 35,000-yard ranges as is now being done.

Actually the above quotation has particular reference to North Sea conditions and to the armor of the British battle cruiser. It cannot be made to refer to the British battleship, for the latest of them in the Grand Fleet at Jutland had approximately the same protection as their German contemporaries. Nor had they sacrificed anything to speed for they were half a knot slower than their opposite numbers in the High Seas Fleet.

(4) Superior speed, it has been claimed, permits choosing the bearing on which to open fire in order to take advantage of light or wind. Modern improvements have increased and complicated the factors determining the most favorable bearing so that they tend to cancel each other. The increase in ranges—to 30,000 yards—increases time required to change bearing so that it is ex-

cessive, and it is consequently not worth while to attempt to change bearing. Finally, if the desired bearing is attained, the wind may shift or light conditions change.

Comment—So long as wind and light continue to have an effect in naval engagements there will be, in the majority of cases, some firing bearing more favorable than any other. That the increase in the factors which determine this bearing complicates matters is true. But there is no more probability that twenty factors will cancel each other than that two will do so.

The argument about increased ranges—30,000 yards—requiring increased time to change bearing does not jibe with the previous contention that 90 per cent of the time the range would be limited to around 10,000 yards. However, assuming that ranges have been increased and hence that more time is required to change bearing, this condition calls for more speed, not less.

The fact that, having attained the proper bearing, light and wind may change is true and cannot be gainsaid. It has been true for a long while.

(5) The faster fleet, it has been claimed, can form tactical concentrations on portions of the slower fleet. But the *Blücher* was sunk at Dogger Bank not due to lower speed but to faulty formation. Twice at Jutland, Jellicoe effected a concentration on the head of the German column. But neither was the result of superior speed, and in both cases the Germans were able to withdraw. Since Jutland the situation has been modified by an increase in gun ranges, a decrease in numbers of battleships, by dependable air scouts, and by better communications, all tending to facilitate withdrawal from unfavorable tactical concentrations.

Comment—Whether or not it was a blunder to put the *Blücher* last in column is open to question. She was an armored cruiser of 15,000 tons with eight 8-inch guns and twenty-two and one-half knots speed. She was in company with battle cruisers of 22,000 to 26,000 tons, with 11-inch and 12-inch guns, and twenty-seven and twenty-eight knots speed. In a word she was "of an inferior class, not fitted to engage battle cruisers." To have put this vessel in an interior station would have slowed the entire German formation and resulted in a decisive engagement with the enemy who was superior five to four in numbers and two to one in weight of metal. However, that the British were able to catch the *Blücher* was due to the fact that they had superior speed and to no other reason.

As to Jellicoe's two concentrations at Jutland, it is difficult to understand how a force that "was never seriously engaged" can be said to have made a concentration on anything.

Relative to greater ease of withdrawal from an unfavorable situation, what is probably meant is that, with modern developments, leading an enemy into an unfavorable situation becomes more difficult. However, whether it is a question of ease of withdrawing from, or difficulty of leading into, an unfavorable situation, the importance of speed—to the offensive—has been increased rather than decreased. And, with an alert opponent, once in an unfavorable situation it may be too late to think about withdrawal.

(6) Superior speed, it has been claimed, makes possible overtaking and destroying a retreating force. But to beat the enemy or make him retreat requires superior fighting power which, under the Washington treaty, cannot be combined in the same ship with superior speed. It is necessary to produce battleships of maximum fighting power and to trust that the retreating fleet will have lost their superiority of speed or that light forces can delay them so that the slower battleships can catch and destroy them.

Comment—The Washington treaty may continue in effect indefinitely without material change, but, where national security is involved, it is not safe to bet too confidently on it. Article XXII of the treaty provides that in case of war affecting national security—that is, any war—the treaty, except for two unimportant provisions, may be abrogated. In the event of a serious war it is unquestionable that a large building program would be immediately put in hand, and that the characteristics of the new ships would be quite different from those so confidently counted on in the essay.

The essay makes much of the statement that it is not possible to combine in one ship speed and fighting power both superior to those qualities in a similar ship of the same displacement. This might be true if in all countries the designers were equally efficient, and if the technicians, metallurgists, and mechanics who execute the design were also equally efficient. But such is not the case.

On paper the *Revenge* class and the *König* class—the latest contemporary ships of the contending battle fleets at Jutland—were almost identical in tonnage, speed, protection, and torpedo power. The essential point of difference was that the British had eight 15-inch guns, the Germans ten 12-inch. Generally speaking a similar relation existed between earlier contemporary classes, and, for that matter, between the battle cruisers.

Let us see how the fighting power, as evidenced at Jutland, compared. Jellicoe, in his official report after Jutland, states that the gunnery of the German battle cruisers was of a very high standard. The High Seas Fleet did not show the same accuracy, but this, he thinks, was due to the unfavorable light rather than to a low standard. The Germans hit the *Tiger* two minutes after opening fire, and the *Lion* three minutes after. In general they fired rapidly and straddled after the second or third salvo. On the other hand there is ample evidence that the British fired slowly and took a long time to get on.

The British shells were faulty and their effect was considerably inferior to the smaller German shells. After Jutland this ammunition was replaced by an improved type which "doubled the power of British heavy guns." Magazines were made secure against flash, and "those steps were taken which in the German Navy had followed the battle of the Dogger Bank."

The German optical instruments were markedly superior to the British. "Their searchlights are superior." Their "organization at night is very good." "Their system of recognition signals is excellent." "Ours (British) is practically nil."

As to tactics the Germans twice successfully executed the simultaneous turn, a maneuver which Jellicoe had dismissed as impossible under fire. "The British scheme of tactics was not equal to the situation, either at deployment or when the Germans turned simultaneously." "Had the British closed . . . . who shall say what victory might not have been accomplished by the British fleet." "But stiff and inflexible, the long British line continued to steam to the southeast by east, while the Germans were steaming off to the southwest."

In other words while the British ships appeared on paper to be at least equal in fighting power to their rivals, they did not prove to be so in actual battle.

As regards efficiency in designing and in executing a design, German submarine engines built during the war were far superior to contemporary engines in other countries as regards reliability, fuel economy, and weight per horsepower. The machinery of their new *Ersatz Preussen* will, if it lives up to predictions, be a marked advance in weight saving and fuel economy over anything yet developed elsewhere. Therefore, while each country has an equal opportunity to evolve a design or to develop a borrowed one, the results are not necessarily equal. And even if they were, the fighting power developed—after the human element has been taken into account—might be something else again.

(7) The essay gives the impression—intentionally or otherwise—that the British craze for speed caused them to develop the speed of their battleships at the expense of their protective qualities, which was directly responsible for many of their losses.

Comment—The following table, showing characteristics of latest British and German battleships at Jutland, refutes that contention. The *Barhams*, though they had no opposite numbers in the German fleet, are included:

Class—Name	*Displacement*	*Speed*	*Submerged Torpedo Tube*	*Armor and Protection*				*Battery*
				Main Belt	*Upper Belt*	*Tur. Fnt.*	*Prot. Deck*	
BRITISH								
Barham	27,500	25	4	13	6	13	1 to 3	8—15″ 42 cal. 12— 6″
Revenge	25,750	22.5	4	13	6	13	1 to 4	8—15″ 42 cal. 14— 6″
GERMAN								
König	25,300	23	5	14	10	14	2½ to 3	10—12″ 50 cal. 14— 6″

(8) The essay presents an entirely misleading view of the trend of British naval opinion—during and since the war—regarding the importance of speed of battleships. Jellicoe is represented as the prime advocate of speed before the war; the man largely responsible for emphasis on that characteristic in British battleships. After the war he saw the rugged outlines of truth and recanted. Fisher, also a prime mover in forwarding high speed theories, had, it is alleged, a mental soft spot. "It is now generally conceded that on the whole he was wrong."

Comment—As a matter of fact Jellicoe was never a particularly strenuous advocate of speed—certainly not to the extent of sacrificing armor or armament. Had he been so, he would have been open to serious criticism, since he was an ordnance expert, and also for years in an influential position in the Admiralty and in a measure responsible for new battleship design.

When Admiral Jellicoe wrote his report after Jutland the rugged outlines of truth had evidently not yet hove into sight. He says there: "I have always expected that they (*König* and *Kaiser* classes) might reach twenty-two knots for a short distance, but the fact that the Fifth Battle Squadron was unable to increase its distance from the German ships when steaming at their utmost speed comes as an unpleasant surprise, and will have considerable effect on the conduct of future operations." Later: "The 'turn away' of the enemy under the cover of torpedo-boat destroyer attacks is a move most difficult to counter, but which has been closely investigated on the tactical board. There is no real counter. Nothing but ample time and superior speed can be the answer. . . . ."

Admiral Beatty in his report of the battle remarks: "High speed is a primary factor of the tactics of the squadrons under my command, and the engine room departments never fail."

Of the trend of British opinion since the war the characteristics of their new construction should give a good idea. In 1921 after consideration by the Admiralty of many designs "embodying the lessons of war experience and the recommendations of the Post-War Questions Committee" four battle cruisers were ordered, speed thirty-two knots. Of course these vessels were eliminated by the Washington treaty. Nevertheless the two battleships which the British were then allowed to build, the *Nelson* and *Rodney*, were given a speed of twenty-three knots, and they have actually made well over that. Nor did this speed appear to interfere with providing nine 16-inch guns, and armor consisting of 14-inch main belts, 15-inch barbettes, 16-inch turrets, and six and one-fourth inch deck, all on a treaty-limit displacement.

(9) The essay produces considerable argument to prove that the armor protection of British battleships at Jutland was deficient. Most of the argument is irrelevant in that it relates to battle cruisers, or in fact to any other type than the one under discussion.

Comment—An examination of the effect of shells against the High Seas Fleet and against the British Fifth Battle Squadron—the only battleships engaged at Jutland—shows no marked deficiency in protection. It is noteworthy that the essay makes no mention of the effect of actual shell fire against battleships.

The High Seas Fleet received a total of twenty-seven hits distributed among six battleships. The damage consisted of the following:

(a) *König*—Serious damage to forecastle; 1,600 tons water on board. This vessel was the head of column.
(b) *Kurfürst*—Two hits on belt armor—no damage; one hit through medium armor; bad leak.
(c) *Markgraf*—Bad underwater hit; port engine disabled; armor hit but not pierced.
(d) *Helgoland*—Fragment of armor driven in bow. Other damage was negligible.

Of course varying conclusions may be drawn from this, but it is hard to imagine it as "evidence that tends to induce certainty of judgment" that protection was deficient.

The vessels of the British Fifth Battle Squadron received twenty-seven hits on three ships. The damage was as follows:

(a) *Barham*—Shell splinter in lower conning tower; belt armor hit and slightly driven in.
(b) *Warspite*—Three shells through thin armor; two through after stack; X-turret hit, no damage.

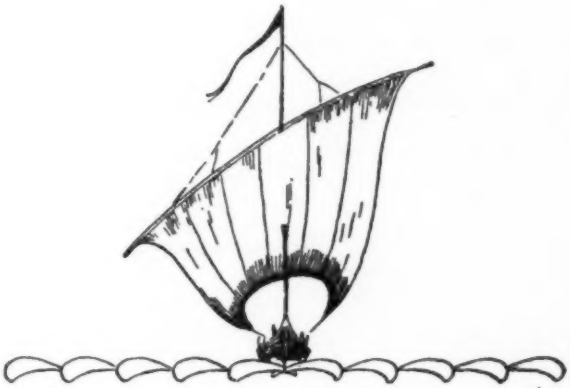
(c) *Malaya*—X-turret roof hit, no real damage; side armor four hits.

The Fifth Battle Squadron, in taking station astern of the Grand Fleet, turned to port and approached the German Battle Fleet closely. The *Warspite's* helm jammed and she described two circles toward the Germans, distance variously estimated at from 8,000 to 12,000 yards. The vessel received the concentrated fire of six German dreadnaughts, and was hit seven times with 12-inch projectiles. The ship was seriously damaged and was ordered to return to port, which she did at sixteen knots. This speed was later increased to nineteen knots, twenty-one, twenty-two knots, and full speed when submarines were encountered.

Here again various conclusions may be reached. But in view of the ordeal of the *Warspite*, the only British battleship seriously damaged, it would seem fair cause for astonishment that the vessel was able to survive at all.

Our Navy—and others as well—has gone off half-cocked more than once. The Civil War *Monitor* was thought to have revolutionized naval warfare, and the type continued to be built up until the beginning of the present century. The monitor idea was reflected in the low freeboard of our Spanish War battleships, which as a result were unfitted to engage in battle on the high seas in any weather. Long after *Lissa* the ram bow continued to add weight and to lessen the hull efficiency of our battleships, while it was about as useful as the old-time pike rack for repelling boarders.

If we are at present in error regarding speed, the rest of the world is also in error—only more so. Should we reduce the speed of our new battleships—if any—to fifteen knots, we thereby immediately reduce the speed of our entire fleet to that figure. We endow our commanders with an initial handicap, strategic and tactical, and renounce definitely the principles and opportunities of the offensive. It seems rather a high price to pay.



PROFESSIONAL NOTES

SEPTEMBER 1 TO SEPTEMBER 30

LIEUTENANT COMMANDER D. B. BEARY, U. S. NAVY
LIEUTENANT COMMANDER D. C. RAMSEY, U. S. NAVY
AND
PROFESSOR HENRY BLUESTONE, U. S. NAVAL ACADEMY

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UNITED STATES

Cruisers Launched

Army and Navy Journal, September 7.—The light cruiser, *Northampton,* was launched September 5, at the Bethlehem Shipbuilding Corporation, Quincy, Massachusetts, the Navy Department announced this week. This is the first vessel of this name in the Navy and was named for the city of Northampton, Massachusetts. Mrs. Calvin Coolidge was the sponsor.

The light cruiser, *Houston,* under construction by Newport News Ship and Dry Dock Corporation, Newport News, Virginia, will be launched today. This is the second vessel of this name on the Navy Register. The first *Houston* was a cargo vessel used by the Naval Overseas Transport Service during the World War. She was originally a German collier, S. S. *Liebenfels,* built in 1903 and owned by the Hansa line.

These two cruisers were included in a program of eight cruisers authorized by Act of Congress, December 18, 1924.

The keel of the *Northampton* was laid in April 12, 1928. She is fitted as a flagship and will be assigned as flagship of the Division 5, Light Cruiser Divisions, Scouting Fleet, when she is commissioned. Her length overall is 600 feet, with a beam of 65 feet, mean draft of 17 feet and seven inches. She has a displacement of 10,000 tons and is equipped with Parsons turbin-reduction gear engines and has eight oil burning boilers. Her armament consists of nine 8-inch 55 caliber guns in triple mounts, four 5-inch 25 caliber anti-aircraft guns, and two 3-pounder saluting guns. She also has two 21-inch triple torpedo tubes, above water. Her complement will consist of 23 wardroom officers, 21 warrant officers, 34 chief petty officers and 519 other enlisted men.

The *Houston* will have practically the same equipment and armament. This ship was authorized December 18, 1924, and her keel was laid May 1, 1928. She is also fitted as a flagship, and upon her completion will be assigned to Division 5, Light Cruiser Divisions, Scouting Fleet.

Scrap Fifty-three Old Destroyers

New York *Times,* September 19.—Washington, September 19.—Fifty-three destroyers of the battle fleet and scouting fleet were ordered decommissioned by the navy today, under its previously announced program of placing out of service approximately that number of destroyers which were built during the World War and by a recent survey were held to be unsuited for further service with the fleets. Their places will be taken by an equal number of destroyers of the laid-up fleet.

Eventually the fifty-three that are to be decommissioned will be scrapped, but the process of decommissioning them and finally disposing of them is to be done gradually and by the crews themselves, so that no unnecessary expense will be involved.

The laid-up destroyers which are to be placed in active service are considered the best of the wartime fleet of vessels of that type and have been held in reserve, while the less desirable ones have been utilized until they are no longer considered serviceable.

Due to the wartime building operations the navy has a surplus of destroyers, and while the present move was initiated several months ago and before the present naval reduction negotiations were instituted with Great Britain, the retirement of fifty-three destroyers will, nevertheless, have a bearing upon the relative naval standing of the United States.

In the same way it was decided several weeks ago to dispose of all but three of the twenty-two second-line cruisers, some of which have been on the navy list for twenty and more years. Most of them in recent years have been held in decommissioned status.

Under the orders issued today Destroyer Squadron 11, less its squadron leader, the *Decatur,* and Destroyer Squadron 12, less its leader the *Litchfield,* both of which are in the Battle Fleet in the Pacific, are to be decommissioned at San Diego. Destroyer Squadron 9 and the experimental ship *Converse,* less the squadron leader, *Dallas,* which are with the Scouting Fleet in the Atlantic, are to be decommissioned at Philadelphia.

Squadron 11 is to be replaced by Squadron 6, now out of commission at San Diego. Squadron 12 will be replaced by Squadron 10, now out of commission at San Diego, and Squadron 9 will be replaced by Squadron, 7, which is now out of commission at Philadelphia.

Army Exhibit

New York *Times*, September 29—The mightiest weapons and most modern machinery developed by the United States Army will be tested and exhibited in a twenty-four-hour demonstration on October 10 at the Aberdeen Proving Grounds in Maryland. Crack troops and equipment will be assembled from all over the country for the occasion, which will be the eleventh annual meeting of the Army Ordnance Association.

The tests will be conducted before engineers and manufacturers who are members of the association and who, it is explained, would assume the job of turning out munitions in case of war. The demonstration is being planned under the direction of Major Gen. Clarence C. Williams, Chief of Ordnance. It is expected that there will be a total of 5,000 official observers, both lay and governmental.

Guns of all calibers, from 16-inch coast defense cannon down to machine guns; light, medium and heavy tanks, bombs of various types and aircraft with their special armament will all be tested and demonstrated. New types of powder, the latest developments in mobility for large ordnance and other special features will be included in the assemblage of wartime devices.

The 16-inch coast defense artillery, the largest in commission, will hurl a 2,100-pound projectile thirty miles out into Chesapeake Bay. Close behind it will come a 14-inch gun mounted on a railway carriage, which, charged with 450 pounds of powder, will throw a 1,560-pound projectile twenty-five miles. New seventy-five mm. field artillery pieces will hurl fifteen-pound projectiles nearly nine miles. Newly developed thirty-seven mm. automatic cannon and .50 caliber machine guns will open the program in the morning.

Smoke screens, new gases and new high-power explosives will be demonstrated. A battery of tanks, each carrying two six-pounders and five machine guns, will be sent lumbering across country with all guns firing. The new Chrystie tank will demonstrate its fifty-mile cross-country speed. During the night, the latest in anti-aircraft artillery will prove its ability to find its mark, in cooperation with searchlights, which will be trained on a sleeve target towed across the sky by airplane.

The tests will be official, General Williams announces, and will be primarily for the purpose of keeping the potential munitions makers of the country in touch with ordnance developments.

$12,000,000 Dam For Canal Zone is Approved

The Nautical Gazette, September 21—Another step toward the prevention of any possible congestion in the Panama Canal was taken this week with the approval of Secretary of War Good, for the erection of a $12,000,000 dam at Alhajuela, Canal Zone, to provide additional storage for water.

The dam will provide a reservoir of 22 square miles and permit storage of 22,000,000,000 cubic feet of water. According to information furnished the War Department by Governor Harry Burgess of the Canal Zone, a water shortage threatens the rapidly increasing traffic during a portion of the year. The new dams will be an aid in checking the waters of the Chagres River during the rainy season, which have been a hazard to navigation. About five years will be required to complete the approved construction.

GREAT BRITAIN

New Methods Discovered Of Locating Submerged Undersea Boats

Baltimore *Sun*, September 22—London, September 21 (Special Cable)— In naval circles here there is speculation as to whether, at the proposed five-power naval conference, Britain will play what naval experts regard as her trump card—in other words, whether it will be announced publicly that the development of anti-submarine protection by the British Navy has been so far advanced that Britian does not care whether other nations construct submarines or not but favors their abolition on purely humanitarian grounds.

When at last year's naval conference the terms of the so-called Anglo-French "compromise" became public it was found that the Conservative Government had no objection to the unlimited construction of small submarines by France.

It is now possible to reveal that even at that time the British naval experts were confident that the possession of a large fleet of such war craft by a near neighbor constituted no serious menace to the country's shipping.

It still is admitted that big ocean-going submarines might manage to play havoc with British ships in the same way that the German warship *Emden* did during the World War as a surface craft, hence the Admiralty's insistence upon a number of small cruisers. But in narrow seas, the Admiralty has informed the Cabinet, submarines can no longer be considered a serious menace.

This assurance has been given as the result of experiments carried out over a period of several years from the submarine base at Portland on the channel coast, where the Navy's anti-submarine school is located.

The Admiralty places its confidence in its being able to deal with undersea war craft, chiefly on what is termed an almost uncanny perfection of the listening apparatus its experts have evolved.

It is asserted by British naval technicians that the service has created microphones, or sound-ranging apparatus, which are so highly sensitive that submarines can be detected and it can be determined, with some certainty, whether submerged bodies are metallic objects or merely rocks.

Hitherto the only recourse of a submarine when "spotted" by listening devices was to sink to the bottom and shut off her engines, but this will avail them nothing if they can be located when lying idle.

These microphones, details of which naturally are closely guarded, are said to be strongly constructed and quite capable of producing satisfactory results even when not installed or operated by experts. They can be fitted to any type of ship.

The mechanics of the methods which have been evolved at the Portland base are as follows:

When a submarine, with propellers running, comes within range of the listening sets, her position and course are checked by cross-bearings—and then it is left for destroyers, submarines or hydroplanes to attack with depth bombs.

The British also have constructed mortars with which depth charges can be dropped by slow-moving vessels sufficiently far enough away from themselves to avoid danger from the ensuing explosion.

Up to the present only fast-moving vessels have been able to drop depth bombs, since the explosive goes off almost instantaneously.

Detection of motionless undersea craft, it is said, is carried out by echoes; that is, when it is suspected that a submarine is in the vicinity patrolling vessels sound "submarine" bells or produce other underwater sound waves and judge by echoes received whether the sound waves are being returned by rocks or by the metal hull of a submarine.

It is further claimed that both methods of detection have been so far developed that submarines can be located before they get within torpedo range.

The Portland base schools also are said to have improved the old wartime precautions, such as defensive nets, and to have perfected explosive paravanes which can be fired either by contact or electricity. The paravane is a device, invented by the British Navy during the World War, which is attached by wires to the bow of a ship. It is shaped like a small torpedo. The force of the current as the ship cuts through the water and a system of rudders force the paravane outward away from the ship, so that it meets and sweeps away floating objects such as mines.

Cruisers Withdrawn From Active Service

By Richard V. Oulahan

Special to the New York *Times* September 16—Washington, September 15—In preparation for a treaty agreement with the United States for naval disarmament, the British Government already has begun to withdraw from active service some of the cruisers which it will be obliged to scrap prior to 1936 but which have not yet reached the age limit when, under the prospective terms of the treaty, they will be retired and their tonnage replaced in part only.

Five British light cruisers which have not reached the age limit have been ordered placed on the disposal-for-sale list.

They are the *Yarmouth*, 5,250 tons, whose age limit for retirement will not be reached until 1932; the *Sydney* and *Melbourne*, 5,400 tons each, age limit 1933; the *Birmingham*, 5,400 tons, age limit 1934; and the *Conquest*, 3,750 tons, age limit 1935. The total tonnage of these cruisers is 25,200.

Fourteen other British cruisers, all of them small, will reach the age limit of retirement by 1936. All of these will be retired in accordance with the projected terms of the disarmament treaty as they reach the age limit and will be replaced in part only.

Age Limit of Large Cruisers

All the larger British cruisers are new and the oldest of these will not reach the age limit until 1938.

These vessels are the *Dartmouth*, 5,250 tons, due for retirement for age in 1931; the *Lowestoft*, 5,440 tons, age limit 1934; the *Comus, Carysfort, Cleopatra, Calliope, Champion* and *Castor*, each of 3,750 tons and each due for retirement for age in 1935; the *Brisbane*, 5,400 tons, age limit 1936, and the *Cambrian, Canterbury, Constance, Centaur* and *Concord*, each of 3,750 tons and due to be retired for age in 1936.

The total tonnage of these fourteen ships is 57,340.

Prime Minister MacDonald has announced that in the interest of bringing down the larger British cruiser tonnage to an approach to parity with the United States cruiser fleet, work on the construction of two 10,000-ton crusiers, the *Surrey* and the *Northumberland*, has been suspended.

With five cruisers of a total tonnage of 25,200 already ordered disposed of, fourteen cruisers of a total tonnage of 57,340 to reach the retirement age by 1936 and two cruisers of a total tonnage of 20,000 not to be finished the grand total of British cruiser scrapping, retirement of non-construction up to 1936, the year that according to the preliminary agreement between the United States and Britain, the two cruiser fleets will reach the fixed maximum, will be 102,540.

Some New Cruisers Planned

It is the intention of the British Government, as made known in the preliminary exchanges, to replace part of this tonnage with new cruiser construction.

The tonnage figures given above are in what are known technically as normal tons, which means the weight of water displaced by the ships when they have fuel and reserve feed water on board. In tables published by the Navy Department yesterday and printed in the New York *Times* today, figures for cruisers of Britain as well as the United States were given in standard or treaty tons, that is, the displacement of water when the ships in question are not loaded with fuel and reserve feed water. The total tonnage of British cruisers in commission, under construction and authorized, as given in standard tons in yesterday's table, is 401,791.

As figures of standard or treaty tonnage for individual British cruisers named above are not available today, there must be some divergence from strict accuracy in showing the amount of cruiser tonnage the British must sacrifice up to 1936 in order to reach constructive parity with the American cruiser fleet, but this divergence is comparatively slight, and deducting normal tons to be retired from the present British cruiser total in standard or treaty tons gives an approximate idea of what deductions from their cruiser strength the British must take in the next seven years.

Cut of 62,000 Tons Needed

The present total British cruiser tonnage in standard tons, as contained in the Navy Department figures of yesterday, is 401,791. To bring the British total down to the 339,000 tons which the British contend are necessary for their defensive and peace-time police needs it will be necessary to reduce this total of 401,791 by approximately 62,000 tons.

With the British to dispose of 102,540 tons of cruisers prior to 1936 through scrapping already ordered, decision not to continue the construction of two large cruisers, and the retirement of cruisers that normally will be due for retirement in the next seven years, the indications are that this retired tonnage will be replaced by about 40,000 new tonnage in cruisers in order to maintain the prospective treaty minimum of 335,000 tons of cruisers for that government to be achieved in 1936.

The situation of the United States Navy with respect to cruisers is somewhat different. With our cruiser tonnage far below that of Britian, the preliminary agreement contemplates that this government will complete its cruiser program up to about 300,000 tons. The exact figures have not been disclosed, but the indications are that the total will not be greater than 300,000 tons and probably somewhat less. Present unofficial supposition is that the preliminary agreement between the two governments contemplates fixing the ultimate American cruiser tonnage at about 295,000.

The disparity of approximately 40,000 or 45,000 tons of cruisers in favor of Britian as compared with the American cruiser fleet constitutes the most serious prospective peril to the disarmament treaty, which the Brit-

ish and American Governments in negotiation with France, Italy and Japan, hope to conclude as a result of the formal disarmament conference to be begun in December, according to present plans.

Yardstick to Solve Problem

As has been explained frequently, constructive parity between the two fleets is to be achieved by comparing American and British warships by the measurement of their efficiency as combatant ships and not merely by tonnage, as heretofore. This yardstick or equivalent valuation method will be applied in measuring the comparative strength of British and American cruisers through giving higher values to new ships than to old ships of the same tonnage and higher values for superiority in gun power.

In that way it is hoped to bring the British and American cruiser fleets to approximate parity in spite of the fact that the British cruisers, in which small vessels claimed to be valuable chiefly for police work will predominate, will be 40,000 or more tons greater in actual tonnage than American cruisers, in which the heaviest cruisers permitted by the Washington naval treaty of 1922 and armed with 8-inch guns, the heaviest caliber permitted by that treaty for cruisers will predominate.

In the preliminary negotiations Britain has assented to the United States having a larger number of 10,000-ton cruisers armed with 8-inch guns than Britain. The British have agreed to limit their number of 10,000-ton cruisers to fifteen. It is believed that they assented in the final arrangement that the United States shall have nineteen cruisers of 10,000-tons, instead of eighteen as proposed in the British memorandum, which was the object of a series of protracted conferences at the White House and the Navy Department last week, attended by President Hoover, the Secretaries of State and the Navy, members of the Naval General Board and others.

19 Cruisers Suggested

Such an arrangement would give the United States 190,000 tons of 10,000-ton cruisers, as against 150,000 tons of 10,000-ton cruisers. In addition, the two governments decided to leave to the formal disarmament conference for adjustment the determination of whether the United States should be permitted to build three additional 10,000-ton cruisers or should be restricted to using an additional 40,000 tons in the construction of four or five smaller cruisers armed with 6-inch guns.

Granting that the preliminary agreement provides that the United States shall have nineteen cruisers of 10,000 tons each, an agreement in the formal conference to permit the United States to build three more cruisers of that size would bring the American tonnage in 10,000-ton cruisers to 220,000, as against 150,000 for Britain in the same class of ships.

While the preliminary negotiations were in progress there was a disposition on the part of some members of the Naval Affairs Committee of the Senate and the public to take the position that any treaty with Britain which would not enable the United States to complete its fifteen-cruiser program, authorized by the last Congress, would be entirely unsatisfactory to Congress.

Any such attitude in the Senate is important, as the prospective disarmament treaty must be submitted to that body for ratification. Since the completion of the preliminary exchanges, interested Senators have shown a disposition to be reticent as to opinions concerning the outcome. They take the position that they do not know the details of the preliminary arrangement and therefore are unable to pass judgment on it.

General Board Satisfied

Certain Senators who have been foremost in contending that all the fifteen cruisers authorized by the last Congress must be built have made known to the administration that they will not assent to any treaty providing reductions in naval armament that does not have the approval of the Naval General Board. In this connection the understanding that the General Board is satisfied with the outcome of the preliminary negotiations is of the highest importance.

They allow more 10,000-ton cruisers for the United States than for Britain, and it appears to be certain that the General Board will give the fullest approval to any treaty arrangements if it provides that the 30,000 additional cruiser tons which the British have conceded to the United States shall be utilized in constructing three 10,000-ton cruisers, thus, according to prevailing under-

standing, providing for completing the fifteen-cruiser program with the exception of one vessel.

It is gathered that the National Board is satisfied with the outcome of the preliminary exchanges for another reason. The contemplated treaty for which the preliminary agreement lays the foundation will provide for standardization and stabilization of naval strength and the maintenance of constructive parity between the American and British fleets. Through such an arrangement the navy will know where it stands in future.

The uncertainty as to future construction and consequent uncertainty as to the number and classification of personnel will provide a new deal, which, it is claimed, will permit the navy to see ahead and carry out its plans for the maintenance of a balanced fleet.

Comparison of Gun Power

An idea of how the excess of British cruiser tonnage may be overcome in attempting to reach parity in effectiveness between the two governments, through giving greater gun power to the largest American cruisers, is obtained by a comparison of the gun power of British and American ships of 10,000 tons.

Of the eight American 10,000-ton cruisers now actually under construction, some of which soon will be in commission, the *Pensacola* and the *Salt Lake City* will have main batteries of ten 8-inch guns each. Of the six other cruisers of their class each will have nine 8-inch guns.

With the tendency to give nine guns of that caliber to future 10,000-ton cruisers of our navy, the nineteen cruisers which it is expected the United States will be enabled to build in accordance with the preliminary agreement with Britain, would embrace two with ten 8-inch guns each and seventeen with 153 8-inch guns in all, or a total of 173 guns of that caliber.

British 10,000-ton cruisers each carry eight 8-inch guns. With the British agreeing to limit their 10,000-ton cruisers to fifteen vessels, the 8-inch guns of these ships would aggregate 120. Thus, the United States fleet of nineteen 10,000-ton cruisers would have fifty-three more 8-inch guns than the British cruiser fleet of fifteen vessels.

Should it be arranged in the formal conference that the United States shall be permitted to utilize its 30,000 additional cruiser tons in three 10,000-ton ships, the aggregate of 8-inch guns on American cruisers would be an even 200, as against 120 for the British.

Mediterranean Fleet Important

It is realized that difficulties will be encountered in the prospective formal naval conference with France and Italy (if they accept the invitation to participate) insisting that their special needs as to the Mediterranean must be considered. The danger in this respect is that Britain must also have regard for her home defenses and her trade routes through the Mediterranean, and the strength of France and Italy in auxiliary ships is a factor of importance to the British Government.

But France and Italy have been kept informed of the preliminary negotiations at every stage of their progress, and unofficial indications that they are disposed to enter the formal conference has considerable significance in the light of their knowledge of the understanding as to fundamental principles between Britain and the United States to govern them in the negotiations of a disarmament treaty to which France, Italy and Japan will be asked to subscribe.

The action of the Japanese Government in letting the other powers know that Japan will expect to be given a higher ratio in warship strength than 3 as compared with 5-5 for the United States and Britain may produce some worry with respect to cruiser tonnage, but in its general aspect there is no concern over it on the part of the two chief naval nations. Japan will ask that her ratio be increased from 3 to 3.5, or, to put it another way, from six-tenths of American or British naval strength to seven-tenths.

It is believed, however, that Japan's chief purpose in determining to ask for an increased ratio is founded on national pride and not on any intention to build up to the additional warship tonnage that would be permitted under the increase. Her object, it is conceived, is to have herself placed before the world as of higher standing as a naval power than the sixth-tenths proportion fixed by the Washington naval treaty for capital ships accorded her.

There appears to be no doubt that Japan is keen for a further curtailment of naval

armament and is wholeheartedly in sympathy with President Hoover's desire that there shall be actual reduction of fleets and not mere limitations of building programs. While insistence by Japanese that her ratio of naval strength should be increased would appear to give a contrary impression, the belief prevails that she will not make any material additions to her fleet. For reasons of domestic economy she is anxious to reduce the heavy cost of naval shipbuilding and maintenance of a large fleet.

Launch Of Two Warships

London *Times,* August 2—There were launched from the naval construction works of Vickers-Armstrongs at Barrow today the British torpedo-boat destroyer *Arrow* and the submarine *Pandora,* which has also been built for the British Admiralty.

The submarine *Pandora* is the fourth of the new P class to be launched by Vickers. Mrs. Little, wife of Rear-Admiral Little, performed the ceremony of launching the *Pandora,* which was the first to take the water. The *Arrow* was launched by Mrs. Addison, wife of Rear-Admiral Addison, Director of Dockyards, and took the water a few minutes later. On the respective launching platforms were British and foreign naval and military officers.

The last destroyer built at Barrow was the *Phoenix,* which was launched in 1911. Vickers-Armstrongs have been relatively busy during the last year or two, but there are misgivings as to the future. Despite the fact that there have been no cancellations of orders held by the firm, fresh contracts have not been forthcoming, with the result that the berths which have been cleared today have nothing to occupy them.

R Class Submarines

It is interesting to state that three new submarines are under construction, and these are of the advanced R class, about which the utmost secrecy is observed.

At the subsequent luncheon Commander Craven, managing director of the Barrow works and a director of Vickers-Armstrongs, referred to certain submarines of the past in which crews of seventeen were required, and contrasted the *Pandora,* launched that day, for which a crew of fifty-five officers and men was required.

Vickers-Armstrongs have orders at present for a submarine depot ship for Chile, a gunboat for Siam, a flotilla leader for the British Government, and a fast cross-Channel steamer for the Isle of Man Steam Packet Company, in addition to the three R submarines.

"Command" of the Mediterranean

The Naval and Military Record, August 28—It is too early as yet to form an opinion as to what effect—if any—the withdrawals of the four Queen Elizabeths from the Mediterranean is likely, to have upon the naval policies of France and Italy. Numerically, the change will leave Great Britain inferior in battleship strength to the forces which either Power can put forth, although in fighting value there is no comparison between our Royal Oaks, the French Lorraines, and the Italian Andrea Dorias. With nine battleships in the Mediterranean, our supremacy was beyond any argument; with five it no longer exists by the measurement of mere tonnage. The rivalry between Italy and France for a claim to dominance in the Middle Sea may be stimulated by the change. Indeed, it is not impossible that in any international conference upon limitation of armaments in which those Powers may take part, we shall hear a new demand for "parity." At present France is the stronger of the two, but Italy has made more relative progress in the reorganization of her Navy since the war.

Fortunately, there is no visible conflict of interests between France and Italy, and the question of which shall claim supremacy in the Mediterranean is therefore largely one of sentiment. Italy, emancipated from the Adriatic by the disappearance of her old rival, Austria, is naturally stretching out, and her scheme of new naval bases suggests ambitious aspirations. Yet it is easy to reconcile those aspirations with the general growth of her maritime interests. Moreover, no country in Europe is more vulnerable to attack by sea. France, of course, is very much concerned with her North African possessions and the necessity for being able to guard effectively the communications with these. In the Press of both countries there has been a tendency to view the naval policy of the other with critical and suspicious eyes, although there is absolutely nothing in their relations or aims to justify anything of the sort.

FRANCE

Building Program Not Retarded

The Engineer, September 13—The proposals for a limitation of naval armaments have not retarded the carrying out of the French program of naval construction. The French are reluctant even to consider any such proposals as practical under present conditions, and will make any question of disarmament dependent upon arrangements for ensuring absolute security. Although it will be another five or six years before the existing program of naval construction is completed, the reconstitution of the fleet is already well advanced, and the appointment of a new command to the Mediterranean fleet has called attention to the progress already achieved, particularly in the creation of divisions of light and fast vessels. Under the special conditions of strategy imposed in the Mediterranean the main essential has been to attain speed with a concentration of fire, and with the light and fast cruisers, submarines, destroyers, torpedo boats and aircraft, the French believe that they are in a fair way of attaining their end. There are three battleships in the Mediterranean, including the flagship *Bretagne,* and others are being refitted, but they are in no sense modern vessels and are not regarded as constituting a real factor of defense. On the other hand, the light division is particularly efficient. At present there are three cruisers and three big destroyers, and before long this division will be reinforced by the addition of the *Tourville,* which is one of the most powerful and the most rapid of the 10,000-ton class. The new destroyers *Guépard* and *Valmy* will be attached to the Mediterranean fleet. They are said to be the largest and fastest vessels of the kind afloat. The *Valmy's* speed very nearly reached 40 knots. There are twelve torpedo-boats of the *Orage* class of 1,450 tons and seven of the *Palme* class of 1,495 tons. To the Mediterranean fleet has been attached the *Béarn* seaplane carrier which has given a good account of itself in recent maneuvers, although it represents the transformation of a 22,000-ton battleship which was left on the stocks during the war. The newest seaplane carrier, *Commandant Teste,* has some resemblance to the 10,000-ton cruisers. Its engines will develop 21,000 horsepower, and it will steam at 20 knots. The aircraft are launched from the deck by catapult.

Destroyer Sets a New World's Record

Special Cable to the New York *Times.* September 22—During trials held for the past two days off the west coast of France the new French destroyer *Verdun* has beaten the world's speed record, formerly held by another French destroyer, the *Valmy.*

Yesterday the *Verdun* made a speed of 40.2 knots over a fixed course, beating the *Valmy's* record of 39.185 knots. The *Verdun* also showed herself to be an exceptionally economic oil burner.

The new vessel, which is of the same type as the *Valmy,* was under the command of Captain Richard during the trials.

JAPAN

Replacement Plan

London *Times,* August 30—The Navy Department has submitted to the Treasury its estimates for cruiser replacement, a plan involving an expenditure of 400,000,000 yen (£40,000,000) during the next six to eight years. The program provides for the construction of four vessels of 10,000 tons each, 15 first-class destroyers, and various submarines and smaller craft. The cruisers are to replace the four much smaller vessels *Tenryu, Tatsuta, Kuma, and Tama,* aggregating 18,000 tons.

Naval officials defend this expansion to the Japanese press by stating that Great Britain's existing and projected strength in large cruisers is 196,000 tons, that of the United States 200,000 tons, while Japan, with only 108,400 tons, requires a further 31,600 tons to attain the 70 per cent ratio.

Treasury officials declare that the plan is unacceptable because it is incompatible with the Government's retrenchment program. The Navy Department doubtless deems it wise to ask for more than it has any hope of obtaining.

Sanction for these estimates for 1930 instead of 1931, when the existing programs expire, is sought on the ground that, according to the press, capital ship replacements falling due after the expiry of the Washington Treaty would form too heavy a financial burden if combined with cruiser replacement. The real explanation, perhaps is that

the Navy desires to enter the forthcoming conference equipped with a program representing its maximum claims.

HOLLAND

A Noteworthy Destroyer

The *Engineer*, August 30—The torpedo-destroyer *Van Galen*, which has been built for the Royal Netherlands Navy by the Fijenoord Company, of Rotterdam, to the designs of Yarrow and Co., Ltd., of Scotstoun, Glasgow, has just completed a very successful series of trials on the Clyde. This vessel is the fifth of eight destroyers which are being constructed in Holland to the designs and under the technical advice of Messrs. Yarrow. In the first four destroyers which are already in service, a boiler pressure of 275 pounds per square inch, with a steam temperature of 610 degrees Fahrenheit, has been adopted. In the case of the *Van Galen*, however, a boiler pressure of 400 pounds per square inch, with a steam temperature of 685 degrees Fahrenheit, is in use, and the same temperature and pressure will be worked to for the three remaining vessels which have yet to be built. We are able to state that the recent trials of the *Van Galen* which is distinguished as the highest pressure destroyer yet built, have fully borne out the advantages of high pressure and temperature which have been so well demonstrated in the recent passenger liners the *Viceroy* of India and the Canadian Pacific liners of the *Duchess* class, all of which ships are fitted with Yarrow water-tube boilers. It will be remembered that the British Admiralty has under construction a high-pressure destroyer the hull for which is being built by John I. Thornycroft and Co., Ltd., and the machinery supplied by the Parsons Marine Steam Turbine Co., Ltd.

MERCHANT MARINE

Training Classes For Ships' Officers Announced

The Nautical Gazette, September 21—As a result of recent ship disasters, Dickerson N. Hoover, supervising inspector-general of the United States Steamboat Inspection Service, has made recommendations relating to the more rigid requirements for ships' officers licenses which will go into effect on October 1. Announcement has been made of a course in ship knowledge, arranged by the Merchant Marine School of the Seaman's Church Institute of New York, 25 South Street, and consisting of a series of lectures by experts from the American Bureau of Shipping's technical staff. The first series on nautical subjects was given on Wednesday, September 18, at 4:00 P.M., and will continue each Wednesday throughout the fall and winter months.

The course was instigated by Captain Robert Huntington, principal of the Institute's Merchant Marine School in conjunction with President C. A. McAllister of the American Bureau of Shipping, who selected the subjects and the American Bureau offered the services of its experts to give lectures in order to acquaint ship's officers and others interested in shipping with a further knowledge of the methods that will be necessary for the new merchant marine. The course is free of charge and open to any persons, in addition to officers and cadets who may be interested in the subjects.

"With the building of larger and faster ocean vessels," declared Captain Huntington, who has trained more than 4,000 cadets to become ships' officers, "it has become necessary for the United States Steamboat Inspection Service to tighten up on the requirements and to make the examination questions more up-to-date and more technical. Hence the Seamen's Church Institute has opened its Marine School to this course."

Subjects to be discussed by experts will include ship layout and construction, displacement, trim, ship terms, tonnages, stability, practical points on loading, fuel conservation, steering, machinery, safety engineering speeds, problem of ship powering, etc.

New Loans by United States

Washington, September 25, Special to Baltimore *Sun*.—Loans aggregating almost $17,000,000 to aid in the construction of ships by private corporations were authorized today by the Shipping Board. Those to which the Government will advance funds are the Dollar Steamship Line, Inc., and the Motor Tank Ship Corporation.

Two loans of $5,287,500 each were made to the Dollar Line to build two twenty-knot

combination passenger and cargo turboelectric steamers of approximately 33,000 tons displacement. The Tank Ship Corporation will receive $6,304,687.50 to construct five motor tankers of approximately 13,450 deadweight tons each. The loans represent three-fourths of the cost of the vessels and repayment is to be made in twenty equal annual installments. Interest is payable semi-annually.

COMPLETION DUE IN 1931

The two proposed steamers of the Dollar Line are to be built by the Newport News Shipbuilding and Dry Dock Company. The first is to be completed by October 1, 1931, and the second by February 1, 1932. The motor tankers will be constructed by the Sun Shipbuilding and Dry Dock Company, Chester, Pennsylvania.

The Dollar Line steamers, when completed, will be placed in the Dollar round-the-world service. The company has seven ships of somewhat smaller size and lower speed in operation on this route.

ADAMS APPROVES PLANS

In the case of both loans, Charles Francis Adams, Secretary of the Navy, has approved the plans and specifications of the vessels, as did the Shipping Board committee on construction loans.

The tankers will be capable of approximately eleven knots speed and will be propelled by single screws driven by Diesel engines. Their displacement will be about 18,900 tons.

Completion of 60,000-Ton Liner Oceanic Postponed

New York *Times*, September 26—Work on the new 50,000-ton liner *Oceanic* has been postponed indefinitely, it was announced tonight by the White Star Line, and priority will be given to the construction of the new 27,000-ton motorship as a sistership to the newly launched *Britannic*.

The keel plates of the *Oceanic* will remain undisturbed at the Harland Wolff Shipyard in Belfast, according to the company's announcement. Meanwhile the owners and builders will wrestle with the new problems of design and propelling power which are facing them as a result of the *Bremen's* record-breaking voyage in July.

There are said to be various alternatives which need further investigation and development "in the light of most recent experience" before the White Star owners will commit themselves.

Tonight's announcement has been expected ever since the *Bremen* shattered all Atlantic speed records on its maiden voyage. The White Star, for example, has been considering the adoption of Diesel engines, but the *Bremen's* voyage was a clear vindication of the geared turbines. Furthermore, the *Bremen's* bulbous bow, and its effect upon its speed, necessitated a complete revision in the designs of competing vessels.

It is regarded as significant that the White Star owners are concentrating on the 27,000-ton motorships, instead of going ahead with the new monster line. Influential shipping men here have long been convinced that comparatively small but speedy ships will prove more profitable than 60,000-ton giants—especially since they necessitate a smaller initial outlay.

It would not be surprising, therefore, if economic as well as engineering considerations influenced Lord Kylsant and his directors in their present decision.

ENGINEERING AND RADIO

Static

New York *Times*, September 29—All sorts of schemes have been tried to overcome static but without marked success. The underground antennæ, which the navy was inclined to believe for a while during the World War were superior to the overhead directive system, have been forsaken. It was found later that static in comparison with signal strength is almost as bad in the ground as it is in the air, according to Dr. L. W. Austin of the Bureau of Standards. A fraud order was issued several months ago against an invention which, it was contended, would eliminate static in radio reception by the underground method. The Bureau of Standards declared the claims false.

Static, like the proverbial ill-wind, has some useful qualities, the contentions of disgruntled listeners to the contrary notwithstanding. And it is these good points that are now attracting radio scientists to further research. Even though the experts themselves do not agree on the cause or causes of static, they are finding it valuable

in the location of storms, and consequently a contributor to the safety of life in the air and at sea.

In Europe, static is being employed to determine the position of storms and to chart weather maps along aviation routes, and in America experiments along these lines are just beginning. The United States Navy has found that static can be used on the high seas to trace the course of hurricanes, thus enabling warships to dodge the storms. In the Northwestern wooded areas of this country, static is being made to warn rangers of approaching forest fires by means of its weather-forecasting proclivities.

Relationship to Humidity

The relationship between weather conditions and forest fires—those originating from natural causes—has been established. This relationship is so definite that the Weather Bureau issues forecasts of forest fire dangers based on the "complement of the humidity." There is an apparent relationship between static and relative humidity; and on this hypothesis the major obstacle to radio reception is being harnessed in order to determine the amount of moisture in the atmosphere.

As forest fires take a toll of approximately $20,000,000 worth of timber and other property annually, the use of static in determining the amount of moisture in the air may compensate for some of the evils that the millions of listeners suffer.

A machine known as the radio direction finder is used to determine the position of storms or low pressure areas. In a paper read recently by S. W. Dean of the American Telephone and Telegraph Company Research Laboratories, before a meeting of the Institute of Radio Engineers in Washington, the operation of this device was described. He told how the Florida hurricane was traced in its sweep up the eastern coast, and stated that storms had been followed at a distance of even 2,000 miles.

This meteorological utilization of static is still in its experimental stage, however, and is most useful where there are few or no weather stations. The United States Weather Bureau, while recognizing the value of the work, has, as yet, not adopted the methods in its own system.

There are two schools of thought on the origin of static, according to Dr. Austin. One group holds that static for the most part is caused by lightning. Thus, even if there is no storm within 1,000 miles of you, the static that troubles your receiver may come from a lightning discharge far away, mayhap the other side of the world. Their contention is that there is always lightning somewhere in the atmosphere and that the waves caused by the discharges are carried over the world.

The second school of experts admits that lightning is a prominent cause of static, but contends that there are other electrical discharges, not visible to the eye, which are also to blame. For instance, the contact between two currents of air of different temperature may effect such a discharge. Static is worse in low-pressure areas and in mountainous regions, Dr. Austin said.

Radio Telephone Links New York and Australia

The Baltimore *Sun*, September 26.—New York, September 25.—A group of New Yorkers today talked with a group of Australians 15,000 miles away over the short wave radio telephone.

When the conversation started, the clock in the New York offices of the American Telephone and Telegraph Company registered 4:00 P.M., but the clock in the offices at Sidney, registered 6:00 A.M., and the calendar showed September 26.

Those speaking were Walter S. Gifford, president of the company; Dr. Frank Jewett, head of the Bell Telephone Laboratories, and A. S. MacDonald, of the Amalgamated Wireless of Australia.

Transatlantic Telephone Cable

Engineering.—The first transatlantic telephone cable scheme, which will connect London and New York by land and deep-sea lines, and will provide an alternative to wireless telephony, is now being prepared, and the American Telegraph and Telephone Company, which will operate it, has just completed the purchase of land in the West of Ireland for the site of the Irish terminal station. The main link of the cable, which will run from Newfoundland to Annagh Head, in County Mayo, will be, we are informed, the longest submarine telephone cable in operation. Hitherto it has not been possible, it is stated, to send telephone messages over a distance of 1,800 miles without

the use of intermediate repeating stations, except with such diffusion of the electric signals as to render the voice faint to the point of inaudibility. For this reason no previous attempt has been made to lay a long distance submarine telephone cable. In the proposed new cable the difficulty has been overcome by the use of a new series of alloys as loading materials for the cable and the adoption of a new subtance known as "paragutta" for insulating the conductor. With these improvements, it is expected that the proposed New York-London cable will give maximum efficiency, with freedom from the variations which are characteristic of radio circuits and with the same degree of reliability and secrecy as is obtained in land telephone calls. It is estimated that the work of laying the cable and completing the land connections will occupy about three years, but it is hoped to expedite the work, so as to bring the new service into commercial use before the end of 1932.

AVIATION

Large Camera Tested by Air Corps

The Aero Digest, September.—The United States Army Air Corps at Wright Field, Dayton, Ohio, just completed tests on the world's largest aërial camera, known as the K-7A. This camera, developed to obtain large ground details from high altitudes, weighs 130 pounds. The picture it takes measures 9 by 18 inches. It carries a roll of film 150 feet long and 9½ inches wide. Its operation is fully automatic, and it posseses an automatic registering device by which the elevation of the plane, the time, date and the number of the negative are noted on the film. This camera is electrically heated so that it will function at the below-zero temperatures of the highest altitudes to which the camera is taken. The first photograph with the new camera was taken by G. A. Magnus, piloted by Lieutenant J. F. Phillips, at an altitude of 18,300 feet.

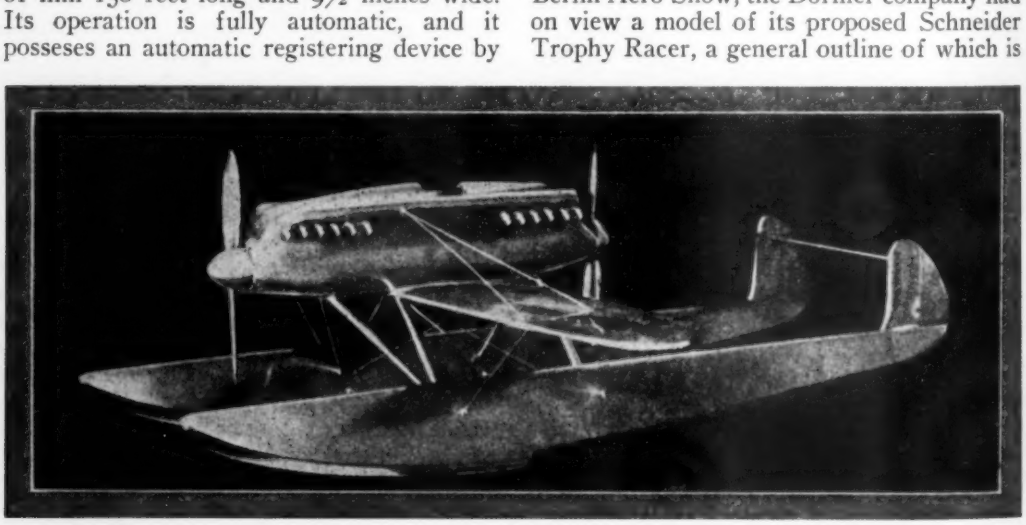
New Landing Platform

The Aero Digest, September.—A revolving and tilting landing platform designed to make possible the landing of airplanes on top of buildings is being tested by the Army Air Corps.

The device consists of a revolving platform 60 feet wide and 210 feet long, which permits pilots to take off into the wind. It can be so maneuvered that a slant of 25 degrees is possible. When planes are taking off, the platform is tilted; and when released the plane rolls down the incline, aided by force of gravity. In landing, the airplane lands at the foot of the incline and immediately is met by a series of spring cable retarders, so designed that they catch the speed of the plane without affording a tipping hazard. A huge reversible fan is also included which creates a gigantic suction of sufficient power to keep the plane from bounding away after landing.

The Dornier Racer

The Aero Digest, August.—At the last Berlin Aero Show, the Dornier company had on view a model of its proposed Schneider Trophy Racer, a general outline of which is



WIND TUNNEL MODEL OF THE PROPOSED DORNIER RACING SEAPLANE

shown herewith. The design is quite novel and original. It consists of a fuselage with twin engines of 1,000 horsepower each, driving two air-screws in tandem. The pilot is placed between the two engines. By this arrangement, greater horsepower can be installed with the same cross-sectional area as a single engine of existing horsepower. It is proposed to turn up the tail of the floats to form a structure on which to mount the tail plane, on which, in turn, would be mounted twin fins and rudders. Dr. Dornier estimates the high speed of this job to be about 350 miles an hour. The machine is not yet being manufactured but complete wind tunnel work and research have been conducted.

The Aim of Highspeed Airplane Racing

The New York *Herald-Tribune,* September 8.—By George Gardner.—The normal speed of the average plane of the future is to be 300 miles an hour, or more, we are told by aëronautical engineers who are in a position to make predictions. And there is but one method of developing this great speed—by building fast planes and flying them.

That is the practical purpose behind a high speed racing contest, such as the Schneider Cup Race.

A type of contest that is important for another reason is that staged for stock ships having speeds no greater than those of planes in every-day use. Such races are held at the air meets throughout the country, the outstanding events of this kind in this country being the National Air Races, concluded recently in Cleveland, and the Curtiss Marine Trophy Race and the Gardner Cup Race.

This stock model type of race demonstrates what can be done with the planes we have now, and teaches pilots how to make the best time with existing designs. The Schneider Cup Race, on the other hand, is a forecast of the future. It is an experimental testing laboratory, in which motors and planes designed for great speed have a chance to show what they can do and reveal weaknesses that have to be corrected.

In France and Italy, and particularly in England, where there is a unit of the Royal Air Force that does nothing but build and fly high speed planes, speed racing is a military project. This was also true of the United States until a few years ago, when both the Army and Navy adopted a policy of keeping out of this sort of competition.

Now, although the air services have fast planes, they have fallen so far behind that they have at last been defeated by a commercial ship. Douglas Davis, of Atlanta, flew a low-winged Wright-powered Travel Air to victory at Cleveland, winning over the fast pursuit planes of both Army and Navy. He made an average speed over the fifty-mile closed course of 194.9 miles an hour, and many times on the straightaways reached 210 miles an hour.

Flying at 300 miles an hour is a sport for the chosen few. An ordinary pilot could no more fly one of these specially built racers, than could an ordinary motorist drive one of the high-powered stream-lined automobiles that break the ground records on the Florida beaches.

At 300 miles an hour "airbumps" are phenomena that are entirely different from "air bumps" at 100 and 150 miles per hour. Instead of bobbing up and down in vertical currents of air, these projectile-like planes cut right through them. And instead of being tossed gently in his seat, the pilot feels the impact against the current almost as if he had torn through a solid wall.

He must be strapped tightly in his seat, far more securely than is the flyer with his standard safety belt, not so much to avoid being thrown out, as to avoid being pummeled into a mass of bruises by the sides of the cockpit.

With this precaution, straight flying at this speed has no bad effect upon a flyer. In closed course racing, however, it is necessary to make sharp turns, accomplished by throwing the ship into an almost vertical bank.

This presents a real problem. If the corner is rounded too sharply, centrifugal force drains the blood away from the pilot's head, rendering him unconscious. But he doesn't want to round out the corner too much, because in doing that he will lose speed. He must use his judgment cutting around the buoy marking the turning point sharply, but avoiding the limit at which his senses will be numbed.

The planes are trimmed with an eye to the weight, to a point that makes them vul-

nerable to any slight contact with a bit of drifting wood or other obstruction. They do not leave the water until they are going 100 miles an hour and at this speed any slight collision is likely to break something.

They have to land, too, at this great speed, because the wings will not support them in the air at anything less. Pilots' calculations must be made in split seconds—the technique of taking off and landing, banking, and even straight flying, is entirely different from flying in a commercial or military plane of a standard type.

The Schneider Cup was first offered as a stake for competition by Jacques Schneider in 1912, and from the first the race has been confined to seaplanes. The first contest was held in 1913, and was won by Maurice Prevost of France with a Deperdussin monoplane. He flew 45.25 miles an hour.

It became an annual competition, except that it was discontinued during the war. In 1919 the contest was held, but the judges refused to award the cup because competitors could not cover the course accurately in the heavy fog, and in 1924 the contest was called off. Following the 1927 race, the competition was changed from an annual to a biennial one, to permit more sweeping changes of design.

The United States has won twice, Lieutenant David Rittenhouse of the Navy was the victor at Cowes, England, in 1923, in a Curtiss CR-3 biplane with a Curtis D12A 465 horsepower motor. His average speed was 177.3 miles an hour. Lieutenant James H. Doolittle of the Army won at Baltimore in 1925 with a Curtiss VI 400 619 horsepower motor. His speed was 232.573 miles an hour.

Since that time the Army and Navy have stayed out of the race. Lieutenant Alford J. Williams has attempted privately, with the aid of New York capital, to prepare entries for the 1927 and 1929 competitions. The fact that he was unable to condition his ships in time seems to indicate that this is a project too large for individual effort, but rather for a concerted plan of a military or similar organization.

The "Graf Zeppelin" Flight

Aviation, September 7.—Lakehurst, N.J. —Completing the first circum-navigation of the world by airship, the *Graf Zeppelin* was landed here at 8:13 A.M., August 29, exactly 21 days, 7 hours, 34 minutes after taking off on the historic voyage. Once before the globe had been circled by air, but the American Army aviators who accomplished the feat in 1924 spent six months doing it, because of their many stop-overs. Even their actual flying time; 363 hours, was nearly one-third longer than the 263 hours, 43 minutes flying time required by the dirigible, because of the longer route they followed. The *Graf Zeppelin's* average speed was put at 39.09 m.p.h. and its air speed 75.84 m.p.h. The total distance covered was approximately 20,000 miles.

Three intermediate stops were made, at Friedrichshafen, Tokio, and Los Angeles. The longest leg, from Friedrichshafen to Tokio, was about 6,800 miles, and was covered in approximately 101 hours. On each of the four jumps, the time actually required to cover the distance was less than the estimate made beforehand, while the final arrival at the end of the trip was five days ahead of the date originally set. In consequence, the previous record of 23 days, 15 hours, 21 minutes, for circling the world, established last year by John Henry Mears and the late Captain C. B. D. Collyer traveling in fast steamships and their own airplane was reduced by more than two days. It was thought that the seven members of the crew who came across the United States via Transcontinental Air Transport might arrive here before the *Zeppelin,* thus gaining the record for themselves, but they failed to do so by four hours.

Competent weather reports furnished by the governments of the various countries traversed helped to make the trip of the giant dirigible successful, but as a matter of fact the airship showed a remarkable ability to proceed in spite of conditions. Serious storms encountered both over the Pacific and in western United States were "ridden out" without difficulty and even without any great anxiety on the part of passengers or crew. About 40 of the 68 hours required for the crossing of the Pacific were spent in blind flying through heavy fog, yet the airship kept its course perfectly. The original plan of selecting the route for each leg of the trip from weather reports received just before the takeoff did not result in any very large deviation from the natural airline course between the scheduled stops.

The trip was marred by only two mishaps.

At Tokio, struts of a rear gondola were damaged while the dirigible was being taken out of a hangar which provided only 18 inches clearance, and a delay of about 24 hours resulted. And as the airship left Los Angeles, the rudder fouled one of the wires of an electric power line and was slightly damaged, though not sufficiently to stop the completion of the trip. The *Zeppelin* had a narrow escape on this occasion, however-as contact between the power line and the metal hull might have resulted in an explosion of the hydrogen gas in the envelope.

While the trip was not undertaken as a commercial venture, considerable revenue was derived from the $9,000 fare for each passenger who made the complete journey, and from the mail carried. Many people paid the $3.60 to send letters completely around the world, in order to secure the special stamps used and to have the souvenirs. Other charges varied from $.60 for letters between Los Angeles and Lakehurst to $1.80 from Los Angeles to Friedrichshafen. A number of commercial firms also sent light merchandise via the airship as an advertising feature. In addition to twenty passengers, the *Graf Zeppelin* can carry 3,300 pounds of mail and freight, together with full supplies of fuel. The *Graf Zeppelin* was handled at Tokio by a special ground crew assembled by Japanese Naval authorities, and at Los Angeles and here by crews under the direction of the Navy Department. A Navy mooring mast was used at Los Angeles and a Navy hangar here.

Complete data on the amount of fuel consumed, the total cost of trip and other points of special commercial interest are not yet available. As previously reported, the fuels used were "blau gas" taken on at Friedrichshafen, and ethane and "Pyrofax" supplied at Lakehurst, Los Angeles and Tokio by Union Carbide Company. The *Graf Zeppelin* has used "Veedol" oil exclusively on all of her voyages, and also carried a reserve supply of gasoline furnished by Tidewater Oil Company.

The airship remained here only long enough to refuel, starting on for Friedrichshafen at 8:19 A.M., September 2, under the command of Captain Ernest A. Lehmann. Dr. Eckener remained in this country on business. The United States Navy Department accepted Dr. Eckener's invitation to send three naval officers aboard the Zeppelin as passengers to Friedrichshafen. They are: Lieutenant Commander Herbert W. Wiley, commanding officer of the *Los Angeles;* Lieutenant Commander J. M. Shoemaker, and Lieutenant Roland G. Mayer.

The *Graf Zeppelin* was landed at Friedrichshafen September 4 at 2:51 A.M. New York daylight time, completing the Atlantic crossing in 67 hours, 33 minutes. A record of 20 days, 15 hours, 17 minutes was made around the world from Friedrichshafen to Friedrichshafen, lowering her record from Lakehurst to Lakehurst by about 17 hours.

The Schneider Cup Race

Aviation, September 21.—The Schneider Race ends in a British triumph. Equally remarkable are the care devoted to the elimination of parasite resistance in the competing machines, the success in boosting the power of an engine already of high performance to more than double its rated power. and the smoothness with which the members of the team handled their meteoric craft. Whatever regret many Americans may feel that they were unable to be represented by a team and to prove the mettle of their own products and the quality of American piloting, there will be no lack of warmth in our congratulations to the British industry and to the Royal Air Force. They did the work given them, and did it with splendid success.

The completion of one Schneider race is always merely the starting point for discussion of the next. Newspaper reports after the recent race suggested the possibility that Italian competition might not continue. There has been no such intimation in official reports from Rome. General Balbo has looked forward to more Schneider contests in the future, but there are many in aëronautical circles in England and in Italy, as there were many in America during the years of our own competition, who feel that the drain upon national resources both in time and money is excessive, and that any good opportunity of withdrawal from governmental participation should be welcomed. A widespread conviction that the burden of annual international speed competition had become excessive was responsible in 1927 for increasing the interval between races from one to two years, and the possibility of further fundamental changes in the conditions of competition will

no doubt be broached at the next meeting of the F.A.I.

One thing is certain. The Schneider race can no longer be considered as simply a sporting event. It is too costly, and the preparation for it lays too great a load upon the industry, to permit of its being regarded in that aspect. The condition under which the race is to be continued, and also the desirability of competition by any particular country, must be determined primarily from the point of view of industrial and technical benefit likely to result. Where countries have abstained, as France has done for many years and as the United States did this year and in 1927, prestige may be involved, but sportsmanship is not. The decision to remain out of the competition represents only an inability on the part of government officials to see where and how the necessary expenditure would repay itself.

It is interesting to note that whether there has been much racing going on or only a little, and whether many nations have been actively participating or very few, the rate of upward progress of the world's speed records has been almost constant for many years. From 60 m.p.h. in 1910 to 260 in 1923 and to 360 in 1929, advance has been made, with singularly little variation, at the rate of 30 m.p.h. every two years. We agree with views recently expressed by Secretary Davison that the speed of racing machines has risen more rapidly than has the ability to put what has been learned from racing into service in practical military and commercial airplanes. We do not believe that a reduction in the number of international competitions for speed would substantially retard the progress of the art. We hope that the F.A.I. will give serious consideration to a further increase in the interval between races to three or even four years.

The Heinkel K-Z Catapault

The Aeroplane, September 4.—Catapault starting for sea going aircraft has been in use some time in naval aviation. In the last year or two, attempts have been made to use similar methods for speeding up mails across the Atlantic.

In August, 1928, a Loire and Oliver flying boat with a 480 horsepower Gnome-Rhone Jupiter engine was launched by catapault from the French liner *Ile de France* when the ship was still 500 miles from New York. By flying this distance twenty-four hours was saved over the ordinary mail transit time. The scheme was suspended in October of the same year, after a flying boat from the same ship had been forced to alight on the sea near the Scillies.

The North German Lloyd liner *Bremen,* recently very much to the fore as a result of her winning the blue ribbon from the *Mauretania,* has been equipped with a catapault. This catapault which has been designed and built by a well known German firm of aircraft constructors, Ernst Heinkel Flugzeugwerke, is used to launch an H.E.12 Heinkel low wing monoplane (500 horse power Pratt and Whitney Hornet engine). This seaplane is being used to deliver mail and customs papers ahead of the ship.

The Heinkel catapault as fitted to the *Bremen* consists of a skid or launching trolley accelerated over a launching way about sixty feet long. The skid is operated by compressed air. The catapault is mounted on the top deck of the *Bremen* between the two funnels. The turntable on which it is mounted allows the launching way to be swung through 90 degrees on either side of the ship's course.

The launching way is a light angle iron structure 60 feet, 7 inches long. On the top surface of this structure which is plated to form a platform, are the rails, which appear to be angle irons bolted to the sides.

The skid or launching trolley is built of high grade material highly stressed to keep the weight as low as possible. The skid travels on four shoes and is pulled forward by a cable passing over a return pulley at the nose of the launching way.

Two additional cables run aft from the skid to a drum at the starting end of the launching way. These cables besides serving for testing purposes also appear to operate the brakes. The skid is brought to a standstill in a distance of approximately ten feet.

The operating mechanism consists of a cylinder and piston. This piston has a stroke equal to one-sixth of the accelerating distance on the launching way and is forced out by compressed air from the ship's normal supply.

The cable after passing over the pulley at the nose of the launching way passes over a fixed pulley at the inner end of the struc-

ture. From here the cable is wound several times alternately round pulleys on the piston and pulleys fixed to the structure. When the piston moves outwards more cable is needed to span the distance between the fixed pulleys and those on the piston. This has the effect of dragging the skid forward at many times the speed of the piston.

The ropes that run aft to the braking apparatus can also be used to rotate a flywheel which acts as an indicator that the catapault is operating correctly.

The maximum acceleration produced by the catapault is not over three times gravity. The flying off speed is given as sixty-eight miles per hour. The maximum weight of the skid complete with machine in place is 7,730 pounds.

Blind Flying and Landing by Lieut. Doolittle

The Baltimore *Sun*, September 25.—New York, September 24.—Something new in airplane flying was demonstrated today when Lieutenant James H. Doolittle, of the Army Air Corps, took off from Mitchel Field, flew fourteen miles and landed within a few feet from the point of take-off without once looking at the ground or outside his cockpit. The flyer was completely closed in and could see only his instruments.

In the opinion of Harry Guggenheim, sponsor of the "Guggenheim fund for the promotion of aëronautics," under whose auspices the test was made, the problem of "blind" flying, as well as the far more difficult one of the "blind" landings, has been solved.

Following the flight Lieutenant Doolittle explained the instruments needed included an improved device which provides an artificial horizon for indicating the longitudinal and lateral attitude of the plane; a new directional gyroscope, and a barometer sensitive enough to measure altitude even when the plane was only a few feet off the ground.

The most important instrument used, however, was the Mitchel Field radio beacon. This casts a beam twenty or so miles long. When a plane gets off the path of the beacon the deviation is registered on the instrument board.

"We placed the plane in the beam of the beacon," Lieutenant Doolittle said, "and I got into the cockpit and closed myself in.

"I took off, flying by instruments, and followed the beam five miles away from the field, turned, and followed it back in. As you pass directly over the beacon the signals stop momentarily, indicating your position; then they begin again as you get into the beam on the opposite side.

"When I passed the beam I started a stop watch so that I would know when I was exactly two miles from the field on the opposite side. I turned there and returned along the beam. As I knew what obstructions lay in my path, I knew that I could fly anywhere above a hundred feet.

"As I had timed myself, I knew when to expect the signal from the beacon that I was over it again. When this came I was flying at about one hundred feet. I put the nose down immediately for a landing, watching the artificial horizon and the altimeter to check myself and made it without any trouble."

New Shipboard Device for Recovering Planes at Sea

The Aeroplane, September 4.—So far all attempts to use seaplanes in conjunction with steamships have been made either with specially prepared runways or catapault launching devices. The latter method postulates the use of a crane to pick up the seaplane from the water upon its return.

A long runway is not practicable on a liner and a catapault is expensive. In addition if a catapault be used the ship must be stopped to pick the seaplane up from the water and fast mail steamers must not stop.

A method for launching and picking up seaplanes which is used when the vessel is underway and has the important advantage of low initial cost, is known to our German friends as the Kiwullsche Stausegel or the watersail designed by Dipl. Ing. Kiwull.

The watersail is an expanse of canvas about 98 feet long and 33 feet wide with spreader booms on the underside. One end of this canvas runway is attached to the deck over the stern of the steamer and the other ends in a kind of drogue made of wide mesh netting. The end is attached to the ship by tow ropes.

The action of the drogue is to cause the water to roll in over the end of the drogue thus making it easy for a seaplane to taxy behind the steamer, and run on to the trailing runway. Once on the runway the floats

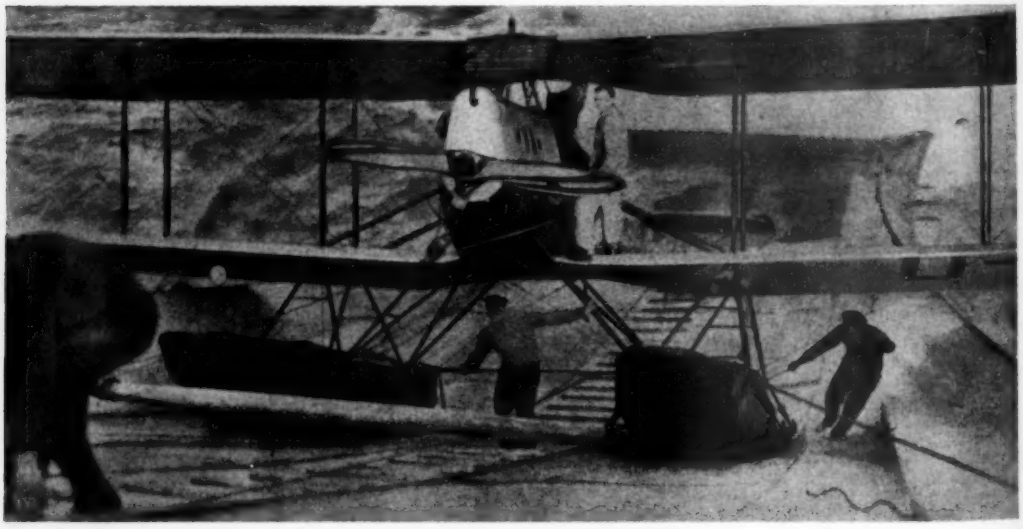
are attached to skids, and the whole machine is hauled up the inclined canvas slope, which is held taut by the pull of the drogue. The process may be reversed for launching.

The Norddeutsche Lloyd Steamship Company are making extensive trials of this apparatus, which has been fitted experimentally to their local pleasure ship *Roland* and their steamship the *Lutzow*.

Airships and the State

The London *Times*, August 27.—The two British airships, the largest yet built, and embodying new principles of construction designed to make for greater safety and economy in maintenance, will soon leave their sheds for preliminary flying trials before making Empire flights to Egypt and India and across the Atlantic to Canada. Thus a huge State experiment is nearing the point at which hopes will be succeeded by performance, but in view of the remarkable world flights of the *Graf Zeppelin* exaggerated expectations may easily be entertained of the speed and range of these two British monsters of 5,000,000 cubic feet capacity.

It is essential, therefore, to make clear certain fundamental differences between British and German airship building, and then to consider carefully the next steps to be taken to bring about the end desired when the British airship program was resuscitated —the transference to private enterprise of the responsibility for further construction and future operation of Empire airship routes. There is a record of nearly thirty years of continuous experiment behind the *Graf Zeppelin*, whereas the British airships may be said to be new creations in which the main consideration has not been commercial performance but absolute safety. The original program laid down in 1924 called for ships able to fly 2,500-mile stages with enough margin of fuel to meet ordinary bad weather and to guarantee regularity of service; and the program had also to take into account ability to fly through the tropics, in which extremes of temperature materially influence the total lift of the ship, and make it highly undesirable to rely upon such a volatile spirit as petrol for fuel. It is not without significance that the *Graf Zeppelin* in its world tour planned its route to avoid any approach to the equator. So far no petrol-fuelled airship has traveled in tropical regions, though if the projected Spanish-German airship route to South America is established this necessity must be faced. Great Britain, with Australia as one goal, and India and South Africa as halfway houses, must definitely accept conditions in which hydrogen and petrol make unpleasant companions, and, therefore, both *R-100*, built by the Airship Guarantee Company, and *R-101*, built by the Royal Airship Works, were designed to eliminate this fuel.



THE WATERSAIL IN OPERATION

When the *R-100* was laid down, Commander Burney was confident that power units burning a combination of hydrogen and kerosene would be available, while the State airship anticipated that compression ignition engines using furnace oil would have been developed by now to a state of efficiency which would make their use profitable in an airship. Early hopes, as in many experiments, have been falsified, and Commander Burney has had to fall back upon aëro engines, using petrol; and the State airship, while it has been able to install compression ignition engines, has done so at a heavy cost in efficiency. Thus *R-100* is barred from the tropics and must be used mainly upon a difficult airship route—that across the Atlantic; and *R-101*, though she can face any temperatures, unfortunately has nearly 1,000 horsepower less than the specification originally called for and about five tons of extra weight in its power cars. This, it must be admitted, is a serious disappointment to both the British designers, and especially to the constructors of the State airships, for it means that the ship will be slower and has sacrificed five tons of useful commercial load which could have been translated into passengers, mail, or greater range. It does not mean that the experiment has been a failure, but that a higher price has been paid for security from the risk of fire; and that a further development is needed to reach the point at which Empire airships become a reasonable commercial enterprise.

On the other hand, so much has been learnt in the construction of these two ships that both designers are confident that they can go on to ships of 7,500,000 cubic feet capacity—Commander Burney contemplates ships of 9,000,000 cubic feet—with improved engine installations and general efficiencies, while the knowledge gained in constructional methods and of the loads taken by the various units is such that in a mere repetition of the State airship many tons of structure weight could be saved. Broadly speaking, the weight of an airship only doubles with increasing size, whereas the volume is cubed, so that every addition to the gas content provides an increasing proportion of lift available over that required to keep the ship in the air. Every ton saved in constructional weight releases an equal amount for a useful purpose, so that the importance of further development for commercial purposes needs no emphasis.

MISCELLANEOUS

End of Capital Ship Foreseen in Accord

New York *Times*, September 16.—London, September 15.—The day of the giant capital ship appears to be approaching its close. It is entirely possible that at the five-power naval conference which meets in London in December serious consideration will be given to the idea of abolishing battleships from the fleets of the world. This would mean that within a few years 10,000-ton cruisers carrying 8-inch guns would be the biggest warships afloat.

And why, it is asked, should any nation need a 35,000-ton floating fortress if no other nation has any such tool of destruction?

When this idea was put forward two months ago, Washington seemed cool to it, perhaps for the very good reason that it desired all efforts to be focussed on the more immediate cruiser problem. But now comes the news from the American capital that it will propose in December an extension of the holiday in capital-ship construction to 1936 instead of 1931. The holiday was decided at the Washington conference in 1921.

This proposal gets a good reception here, and why should it not? It is quite likely the MacDonald Government has already assented. Such assent would involve nothing startling, for at the three-power naval conference at Geneva in 1927 First Lord of the Admiralty Bridgeman proposed "an extension of the accepted life of the existing capital ships from twenty to twenty-six years and a consequent waiver by the three powers of their full rights under the replacement tables agreed upon at Washington."

It would thus seem that the reported American proposal has a good chance of acceptance since Japan was favorable to it in 1927 and since neither Italy nor France is planning to build capital ships to replace their old ones.

In 1927, First Lord of the Admiralty Bridgeman also proposed that new capital ships should have a tonnage limit under 30,000 instead of the 35,000 limit laid down by the Washington naval treaty and that

the guns be limited to 13½ inches instead of 16 inches. If the English repeat these proposals they would doubtless expect American adherence in principle. It is entirely logical that this move toward decreasing the size of battleships should give momentum to the suggestion eventually to abolish them.

Best Chance to Save Money

Both Premier MacDonald and President Hoover are aiming at economy in the cost of battle fleets. There does not appear at this time a large possibility for a great saving of the taxpayers' money in cruisers which are the most useful form of war vessel, especially for defensive purposes, and no nation proclaims any other purpose. Indeed, America will have to build a good many cruisers to achieve actual parity under the proposed plans.

But with capital ships it is a different proposition. Capital ships of from 20,000 to 35,000 tons, of which America has eighteen and the British twenty, counting their four battle cruisers, form about 40 per cent of the tonnage of both navies. England spends $500 a minute on her fleet and we spend more. About half that sum goes to capital ships, and if the interest on the value of the investment they represent is counted it is more than half. It is therefore evident that more money is to be saved in curtailing these $25,000,000 ships with their high upkeep cost than in curtailing $5,000,000 cruisers.

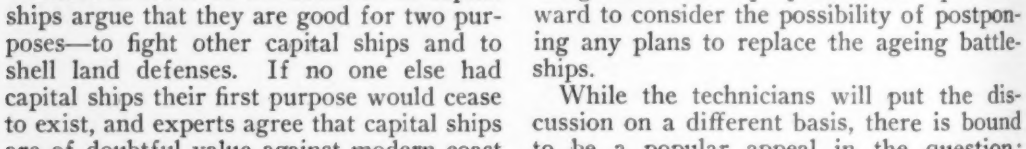
Those in favor of the abolition of capital ships argue that they are good for two purposes—to fight other capital ships and to shell land defenses. If no one else had capital ships their first purpose would cease to exist, and experts agree that capital ships are of doubtful value against modern coast defenses with new high-power guns and airplane observation. Gallipoli showed something about that.

It would be difficult to imagine a situation more favorable for doing away with capital ships than that which exists today. Nowhere in the world is any capital ship being built and no naval program in the world contains any provision for building one. Since the Washington naval conference only four have been put in commission, two by America and two by England. France's newest battleship is fourteen years old and Italy's newest capital ship is one year younger. Certainly neither France nor Italy would have any objection to doing away with a war machine in which they are hopelessly outclassed by England, America and Japan.

It thus is evident the three big naval powers have the situation entirely in their hands. By 1936 England will have two battleships and one battle cruiser less than twenty years old. The United States then will have three battleships within what is commonly called the age of usefulness. By 1940 every battleship in the world would be out of date if no new ones were built in the meantime. Our whole fleet of 10,000-ton cruisers could be replaced new for what it would cost to replace four or five capital ships.

No public statements have been made regarding the Anglo-American conversations about battleships, and up to a few days ago it was not officially admitted that they would be discussed in the approaching conference. But now it is definitely known that capital ships will be one of the items on the agenda of the five-power parley and it may be taken for granted that a proposal will be put forward to consider the possibility of postponing any plans to replace the ageing battleships.

While the technicians will put the discussion on a different basis, there is bound to be a popular appeal in the question: What need has any nation for battleships if no other nation has them? Perhaps in this issue President Hoover will see a real chance for economy in naval expenditures.



NOTES ON INTERNATIONAL AFFAIRS

From September 4 to October 3

Prepared by Professor Allan Westcott, U. S. Naval Academy

NAVAL NEGOTIATIONS

Premier MacDonald's Visit.—On September 28 Premier Ramsay MacDonald sailed on the *Berengaria* to carry out his long planned visit to Washington for personal conferences with President Hoover. The visit became assured when earlier in the month complete preliminary agreement was reached on the scheme of joint naval reductions to be adopted by England and the United States. As roughly summarized in the press, this preliminary understanding provides for parity in destroyers at about 150,000 tons each, parity in submarines at about 88,000 tons, and in cruisers a tonnage of 315,000 for the United States to 339,000 for England, the British preponderance to be counterbalanced by a greater number of American cruisers of large size.

Premier MacDonald in public statements took pains to show that the naval understanding between England and the United States involved nothing in the way of political alliance, and that even the agreement reached on reductions was not absolute but subject to modification in the proposed five-power conference. According to plans made prior to his visit, this conference was to be held in London next January, and invitations were to be sent by England to France, Italy, and Japan. The aim of Premier MacDonald's visit was not to complete the naval negotiations in minute details but to further friendly relations by establishing personal contact with American leaders and the American public.

At the proposed January conference it was believed Japan would call for a considerably higher proportion of cruiser tonnage than that of three to five. Both France and Italy, if they accepted the invitation, would also be extremely slow to accept reduced tonnage in cruisers and submarines. In the French press there were many warnings against dictation from the major naval powers, and against "having the wool pulled over our eyes" as at Washington in 1921. In fact it became increasingly evident that efforts at agreement with these powers might easily upset the painfully concocted Anglo-American bargain. England's demands for tonnage, in particular, will be partly guided by the combined strength of France and Italy in the Mediterranean, and Americans will keep in mind the cruiser strength of Japan.

Shearer Inquiry.—On September 6 came a sensational announcement from President Hoover that he had called upon the Attorney General "to consider what action could be taken" in view of the suit of William B. Shearer for payment for services rendered to three important shipbuilding corporations as an agent at the Geneva Naval Conference. Mr. Shearer was described by President Hoover as "a severe critic of all efforts of our government to secure a naval agreement," who was given credit in the press for wrecking the conference. The President's announcement gave the whole affair the widest publicity and led to an investigation by a Senate committee composed of Senators Shortridge (chairman), Robinson, and Allen. Messrs. Schwab, Grace, Ferguson, Wakeman, and other officials of the shipbuilding companies were called upon to testify as to their relations with Shearer, and activities at Geneva were described by press correspondents,

naval officers, and by Shearer himself. The inquiry—suspended during Premier MacDonald's visit—had at least one important value in that it threw a flood of light on the influence of propaganda, for as well as against disarmament.

NAVIES AND PEACE.—Of chief interest to naval readers in the October number of the quarterly *Foreign Affairs* are two articles on "Navies and Peace," one by Philip Kerr, British editor of the *Round Table* and former Secretary to Premier Lloyd George, and the other by Charles P. Howland, "Research Director of the Council of Foreign Relations" and editor of the annual *Survey of American Foreign Relations.*

Mr. Kerr starts with the premise that the only real danger of war between the United States and Great Britain, and hence the only reason for rivalry in naval armament, lies not in direct conflicts of policy but in the fact that "every European or Asiatic conflict is liable to precipitate an Anglo-American conflict over belligerent and neutral rights at sea." He thinks further that there is slight prospect of removing this danger by efforts to revise international law, either in favor of the belligerent or the neutral, because all such agreements are sure to break down in actual war. His remedy, and what he considers the only effective means of bringing about reduction of armaments, is for the United States and Great Britain to join in efforts to *prevent war:* "The signatories of the Pact of Paris and especially the United States and Great Britain should publicly record that they are all vitally interested in any threat to the peace of the world, and that on such a threat arising they will instantly take council together as to how hostilities can be prevented. What they will do to prevent war cannot now be foreseen. . . . ."

Mr. Howland's view is very similar. He is sceptical about settlement of most points in the laws of sea warfare, and also about ever securing complete parity in Anglo-American naval armament, especially in view of the claims of France, Italy, and Japan. He favors naval reductions, but feels that the real solution "lies in taking the prevention of hostilities anywhere as the essence of the problem of maintaining peace, and of uniting the naval powers in action or attitude to prevent hostilities."

What both writers apparently propose in substance is an agreement of the chief naval powers, the United States, and Great Britain, to "prevent wars anywhere," which might readily constitute a domination that would be greatly feared and resented by the rest of the world.

LEAGUE AND WORLD COURT

WORK OF LEAGUE ASSEMBLY.—The Tenth Assembly of the League of Nations ended September 23 after what was described in the press as "one of its most productive and active sessions," though as a matter of fact its doings received less attention from the press than in the past. One of the most notable achievements was the signing (though not ratification) of the clause accepting compulsory jurisdiction of the World Court by fourteen more nations, including England and most of the British Commonwealths, France, and Italy. Germany signed the clause last year. In a speech before the Assembly, and again at a luncheon where representatives of twenty-seven European countries were present, Premier Briand advanced his scheme for a political and perhaps economic league of European States. It was agreed that Premier Briand should be authorized to send out a circular inviting opinions and suggestions.

Jugoslavia and Peru were elected to seats in the Council vacated by Roumania and Chili, and Poland was reëlected. The budget for League Secretariat, World Court, and International Labor Office was set at $5,642,000, an increase of $230,000 over last year.

LAND DISARMAMENT DISPUTE.—In the Assembly Committee on Disarmament a great disturbance was created when the British representative, Viscount Cecil, proposed that the special Preparatory Committee be called upon to reconsider its decision of last spring excluding limitation of trained reserves and war materials from its draft convention of disarmament. "You have got to limit material," declared Viscount Cecil, "or you have done nothing." His proposals were interpreted chiefly as a disavowal by the British Labor Government of the concessions to the land powers authorized by the Conservative Ministry last spring. They were hotly opposed by France and other land powers, only Germany supporting the

idea of raising again these much-debated issues. In the end Lord Cecil withdrew his resolution and a more innocuous one was adopted which merely called upon the Preparatory Commission to hasten its work and passed no judgment on its exclusion of material and reserves.

ARGENTINA AND THE LEAGUE.—In view of the return of three Latin American states, Bolivia, Peru, and Honduras, to the League after absence since the second session, the indifference of Argentina has been described as the "League's capital enigma." Long ago the president of Argentina accepted League membership, and funds have been voted to pay the annual dues, but the Argentina Congress has never formally acted to ratify membership, and in recent years Argentina has not been represented in the Assembly.

Toward the United States, Argentina has of late adopted a similarly indifferent attitude, treating President-elect Hoover's visit of last year with only belated courtesy, and leaving the Washington embassy vacant now for nearly a year. President Irigoyen's policy has been sharply criticised by the press of the opposite party in Argentina.

ROOT FORMULA APPROVED.—Special conferences in September at Geneva of nations adhering to the World Court gave approval to the "Root formula" proposed by the special committee of jurists for bringing about American entry into the World Court, and also approved an amendment of Article IV of the court statute providing a way for non-members of the League to take part in the election of judges. As soon as the formula and the amendment have been ratified by all members of the court, they will be transmitted to the United States, where they must be ratified by the Senate. Secretary Stimson, expressing the attitude of the present administration, declared that the formula and the accompanying changes fully safeguarded American interests. There is little prospect, however, that the question will come before the Senate within the next year.

COMPULSORY JURISDICTION.—During September fourteen nations in the World Court, including France, England, Italy, New Zealand, Canada, South Africa, Czechoslovakia, and Peru, signed the optional clause accepting in advance the compulsory jurisdiction of the court in international legal disputes. In all, forty-three members have signed the clause, but only eighteen have ratified, and the acceptances have been accompanied by numerous reservations.

INTERNATIONAL BANK ARRANGEMENTS.—Jackson E. Reynolds, president of the First National Bank of New York, and Melvin A. Taylor, president of the First National Bank of Chicago, sailed for Europe at the close of September as American representatives at a conference of bankers called to meet in October for organization of the Bank of International Settlement. This bank, as conceived in the Young Plan, will ultimately have a far wider range of functions than those concerned solely with transfer of reparations, and may take on in the international field a place corresponding to that of central banks in separate nations. The bank will start with share capital of $100,000,000, and control will be vested equally in the "central banks of the United States, Belgium, France, Germany, Great Britain, Italy, and Japan." The American representatives in no sense represent the United States government; they were invited to serve by the European banks represented on the committee. It was believed that Mr. Reynolds would be offered the chairmanship of the committee, the function of which is to complete plans for organization of the bank, fix its location, and draw up its charter.

GREAT BRITAIN

ANGLO-SOVIET AGREEMENT.—Following a renewal of conferences in London at the close of September, Foreign Minister Arthur Henderson of Great Britain and Valerian Dovgalevsky, Russian Ambassador to Paris, announced an agreement by which diplomatic negotiations are to be resumed, ambassadors exchanged, and negotiations begun for settlement of the debt and propaganda questions at issue between the two countries. The renewal of relations prior to settlement of claims and propaganda was an unexpected concession on the part of the British, and strong opposition may be expected when the British Parliament opens in October.

UNITED STATES AND LATIN AMERICA

MEXICAN ELECTIONS.—In the presidential election campaign in Mexico which was gathering headway in September the two candidates were Ortez Rubio of the National Revolutionary party formerly led by Obregon and Calles, and Dr. Vasconcelos of the so-called Anti-Reëlection faction, which declares that the opposing party has abandoned the aims of the Madeiro revolution of 1910. With strong support from labor and agriculture, it was believed that Rubio stood the better chance of election.

CUBAN CLAIMS.—Along with the nomination of Mr. Harry F. Guggenheim as Ambassador to Cuba to succeed Noble B. Judah, the question of claims of American citizens against the Cuban Government came up for consideration during September both in the State Department and in the Senate Committee on Foreign Affairs. In connection with these claims there were protests from American claimants declaring their inability to secure just consideration from the Cuban administration under President Machada, and a resolution embodying these complaints was referred to the Senate Committee. All of the claims were of twenty or thirty years standing, and there were many statements from other American interests in Cuba testifying to fair treatment by the present government.

TRADE WITH SOUTH AMERICA.—According to recent figures, trade between the United States and Latin America has increased six-fold since 1900. In 1928 17 per cent of United States exports went to Latin America, more than equalling the exports of England, France, and Germany combined. In an article on "Trade Rivalries in Argentina" in October *Foreign Affairs* Mr. H. H. Hepwell states that American exports to Argentina in 1927 amounted to nearly $218,000,000 in Argentine gold dollars, as compared with England's $116,500,000, and Germany's $97,000,000. As to whether American trade will be able to continue this ascendancy, Mr. Hepwell writes:

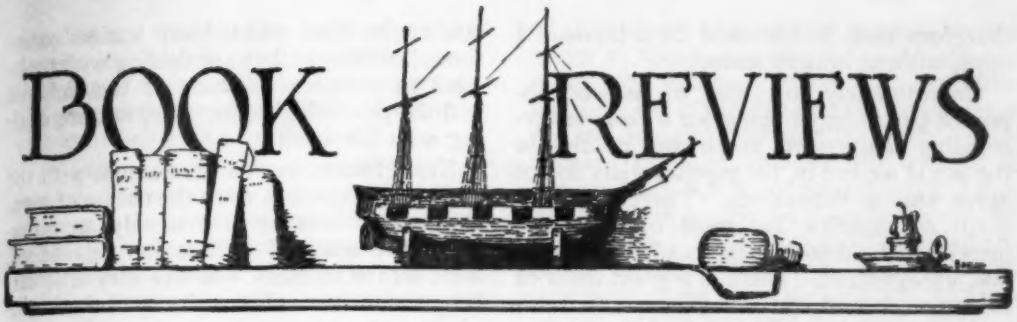
> A conditional answer must also be given to the question that so obviously arises: Will American trade be able to retain its pride of place in the Argentine market? Much hangs upon the extent to which Europe achieves mental as well as physical rehabilitation. And here one inclines to the view expressed by Professor Clive Day in *Foreign Affairs* two years ago, namely that Europe in general appears to be too old to win back the ground lost. His conclusion has a direct bearing on the subject we are discussing, since Argentina's youthful vigor finds a national complement in the energy and invention of a great nation of somewhat the same age—a nation, moreover, which broadly speaking is politically similar, and which is strengthened for commercial competition by the fact that it has met and solved successfully many of the selfsame difficulties with which Argentina herself is striving today.

FAR EAST

THE SITUATION IN MANCHURIA—During the first part of September there were well authenticated reports of severe Soviet bombing attacks on Pogranichnaya, Dalainor, and other railway stations along the Manchurian frontier, during which stations and railway property were destroyed, many were killed, and the towns were temporarily occupied by Soviet forces. These were justified as reprisal measures following Chinese attacks, and on September 25, the Soviet government issued a "firm warning" against any further raids on the part of Chinese or white Russians. Later the border warfare appeared to have slackened; but, largely as a result of the complete confusion of internal politics in China, there was no progress in negotiations. From Japan came the report that if no settlement was reached in two months' time the Soviet government would be ready to seize the Chinese Eastern Railway by force.

REVOLT IN YANG-TSE VALLEY.—In the midst of the Manchurian strife the Chinese Nationalists were again threatened with civil war upon the revolt of the so-called "Ironsides" division of Cantonese troops stationed at Ichang under command of General Chang Fa-kwei. For a time there were fears that this would be the signal for a more general disturbance supported by Feng Yu-ksiang and leaders of the Kwangsi faction hostile to the present régime at Nanking. The Nationalists rushed troops up the river, distributed funds to doubtful generals, and on September 23, occupied Ichang, General Chang's forces retiring southward.

BOOK REVIEWS



BOOK DEPARTMENT

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THE HISTORY OF PSYCHOLOGY. By W. B. Pillsbury, Ph.D. New York: W. W. Norton and Company, Inc. 1929. $3.50.

REVIEWED BY LIEUTENANT COMMANDER A. H. ROOKS, *U. S. Navy*

Modern navies are very complicated affairs, and they daily grow more so. It is said that there is no branch of science unrepresented amongst us, and that we demand practitioners of most of the arts as well. We need technical knowledge of every conceivable variety and are forced by our increasing responsibilities to so saturate our minds with it that we are apt to lose sight of our primary individual functions—leadership, the art of command, the management of men; the elemental business of so directing the activities of our men, and of so arousing their spirit and enthusiasm, that they will form an invincible body. We have had such leadership in the past, and we will continue to have it, but even so there will always be room for improving its quality down through the ranks and files. Improvement will come through a better understanding of the nature of men, and it is the psychologist who has undertaken to instruct us in that. So we share in the present tremendous popular interest in psychology, finding it useful in our art, and fascinating in itself. There is nothing so important in the life of a man as what he thinks about himself and his fellows, and, specifically, about that part of him which is the most mysterious and the most baffling, his mental processes.

We are all practical psychologists of sorts: we observe the behavior of ourselves and our associates, attempt to classify the knowledge thus obtained, to educe therefrom laws which will assist us in predicting future behavior, and then to modify our own actions accordingly. But, admittedly, this process is imperfect, and as life becomes more complex our predictions and our adjustments become increasingly unsatisfactory. So we find the booksellers shelves crowded with volumes on the mystery of psychology, promising to solve our problems. Many of these are of the type which set out to transform morons into intellectual giants—bilge of the muddiest variety. Some, however, are attempts, worthy of our profoundest interest, at popular expositions of psychological systems which are the result of sincere, patient, and laborious investigation, and which, while incomplete, add something of value to the mass of knowledge which will some day be sufficiently organized to be worthy of the name of a science.

Dr. Pillsbury's *History of Psychology* makes a valuable contribution, I believe, to the organization of that knowledge. The publishers, who specialize in this sort of literature, state that it can be relied upon to present an accurate account of the more important events in the development of psychological thinking. Dr. Pillsbury is a graduate and Ph.D. of Cornell; he has been a professor and lecturer at Cornell, Columbia, the Sorbonne, and the University of Michigan; in 1910-11 he was president of the American Psychological Association; and he is the author of several other books on his specialty. This book was written for laymen and

therefore may be reviewed by a layman, I hope, without impertinence.

Unfortunately for those of us who approach psychology hoping for a clear understanding of ourselves and of our relation to the world we live in, the psychologists do not agree among themselves. There are hundreds of theories, but most of them are merely that—theories, untested, controversial, unorganized. There is a great mass of literature, but to one not gifted with Job's patience or Herbert Spencer's ability to generalize, it appears as a chaos. Frequently brilliant in its separate parts, it lacks a comprehensive, acceptable system. There are probably no two psychologists who agree completely as to the nature of man. There are one-man systems, largely theoretical, incomplete, and certain to be attacked by others of the profession. Nowhere can you find a scientific exposition of the central problems; nowhere is it stated succinctly: *this* is the nature of man, *this* the way his nervous system reacts, *this* is how and why he thinks, and *these* are the causes and motives behind his behavior.

H. L. Mencken, in a particularly savage attack on the military, says that the art of the soldier calls for the least professional competency, that the simplest problems of his ancient business flabbergast him. But Mencken's slur is no more true of the military than of the other professions. So, too, do the simplest problems of his art flabbergast the psychologist—and the biologist and the economist for that matter. And with all due respect to Mr. Mencken, the editor, if the public is able to arrive at an approximate agreement as to the precise meaning of the thousands of books and periodicals flooding the stream of literature, it is more due to the resiliency of the human mind than to the skill of those who so solemnly undertake to edit them.

The biologist cannot tell us what life is; the psychologist has failed to tell us the how and why of its behavior; and the philosophers cannot agree as to what gives it value and significance. It would be cheap and absurd to condemn them *en masse* for these failures, for they are dealing with phenomena of extraordinary complexity. But it is equally as cheap and absurd to condemn the military for their failure promptly to extricate the nations from the bloody and dangerous angles into which their leaders sometimes hurl them; they are dealing with problems as complex as those of the biologist and the psychologist, for they, too, are dealing with life itself.

Dr. Pillsbury begins his account with the earliest speculations as to the nature of man. Psychology was at first merely an unimportant branch of philosophy, as, indeed, were all the sciences, and was very little differentiated from philosophy until the beginning of the nineteenth century. The very earliest theories credited man with a mind or soul as an active principle superior to, and working to control, the body. Plato described it in detail, and discussed its faculties. He also attacked the problem of knowledge; for him, ideas were the prototypes of things, that existed before objects in the universe or in the mind of God, and were part of the original endowment of the soul before any experience. At the other end of the history of psychology we find the behaviorists denying the soul and even consciousness, and asserting that the human infant is born without any innate ideas or instincts and with only three emotions, fear, rage, and love, all else being acquired by contact with the environment. Between these extremes lie all shades of opinion, and the casual reader is warned that it will be no light task to undertake their mastery. Among the older theorists we find the faculty psychologists, the atomists, the associationists, the sensationalists, the empiricists, and so on to many another; among the moderns there are the structuralists, the functionalists, the psychoanalysts, the behaviorists, the hormic school, the *Gestalt* school, and the understanding school.

Dr. Pillsbury gives a résumé of the theories of each of these schools, and although he writes as an historian rather than as a critic, what is of great importance to the layman, a perspective by which to judge their relative importance. Of all the modern schools, psychoanalysis probably has had the greatest popular discussion. Of it he writes: "It stands as a strange episode in the history of psychology but one that has not been without many beneficial by-products." And it is interesting, too, to hear him say of James' *Principles of Psychology:* "The book is probably the most interesting work on psychology ever written. . . . . The most striking of

the chapters are those on habit, on the self, on emotion, on will, and on instincts. . . . . Any one of these could be recommended to the general reader, the interest of the material itself being its own reward."

In spite of its chaotic nature as a science, in spite of its numerous and mutually antagonistic schools, psychology has much of value to us as practical leaders and organizers of large bodies of men. There is vast room for improvement in the quality of individual leadership, in the reduction of offense against military and civil law, and in the maintenance of a high morale and *esprit de corps* throughout the Navy. Will someone of patience and ability work through the mass of facts and theories, selecting the good and rejecting the bad, and organize it into a system for the attainment of those ends? It can be done, and should be. But, unfortunately, it would be a heavy task and might bring its author little reward, for as Dr. Pillsbury says in the closing sentences of his book:

> The enumeration and description of the present-day schools show that there is no lack of variety of opinion. If in the world of scientific theory, as in the evolution of living species, the appearance of a great number of "sports" is the necessary antecedent of advance through survival of the fit, psychology is in no danger of stagnation. Fortunately it is not in the province of the historian to prophesy which is likely to survive.

FOREIGN DIPLOMACY IN CHINA, 1894-1900. By Philip Joseph. Baltimore: The Johns Hopkins Press. 1928. $4.50.

Reviewed by Brockholst Livingston

It is certainly advisable for naval officers to be fully informed of the background of diplomacy in China. The desires of foreign nations may at any moment kindle into flame the smouldering remains of interfactional strife. Who knows but that when this appears in print, the war which some have seen coming will have flared into reality?

This volume by Dr. Joseph is an admirable work, even if it may be in parts slightly biased, and supplies a handy résumé of the Chinese question of the period. A feature of it is the prominence given the navies of the world in shaping the methods of carrying out the policies formulated by the foreign offices. In discussing the German acquisition of Kiaochow, the author quotes from a writer of that nation who says: "Up till now it has been necessary to refrain from utilizing such opportunities [as the condition of the missionaries] because the Navy, whose decision must be final for the conduct of foreign politics, has not yet arrived at a definite decision on the question [of a site for a naval base]." Dr. Joseph himself has this to say in regard to certain "telegraphic instructions of the gravest character" received by the British minister to China, which if necessary he "should not hesitate to deliver," that "the presence of the British fleet in Chinese waters was a sufficient intimation to the Tsungli Yamen of what the character of these instructions might be." He states further that within sixteen days, "they [the Chinese] formally agreed to the British demand. . . . ." Such is the strength of sea power.

While the book contains much information of intrinsic value, it is regretted the author felt compelled to enter the realm of fancy in discoursing on such points as the compensation the United States received from Great Britain in return for benevolent neutrality in the South African War and the unimpaired maintenance of Britain's position and policy in China.

Two nations seem to stand out prominently in the affairs of China. "In her eagerness to fulfill her continental territorial aspirations, Japan had created a new international problem of great dimensions—The Problem of China." And, in the estimation of this writer, the actions of the Russian government "were merely quickening the speed with which they proposed to bring China under their domination." Recent history stands as proof of Dr. Joseph's conclusions.

The closing words of the book may, perhaps, be more easily questioned than others. The author writes:

> . . . . without the constant efforts of British statesmen on behalf of the "open-door" policy it is hardly likely that America's proposal would have met with success. In all probability she would not have been admitted to the markets of China. The diplomatic battle which had won the assurances of the powers for the "open-door" had been fought by the British Foreign Office and not by the American State Department. The success was, in fact, a victory for the British policy.

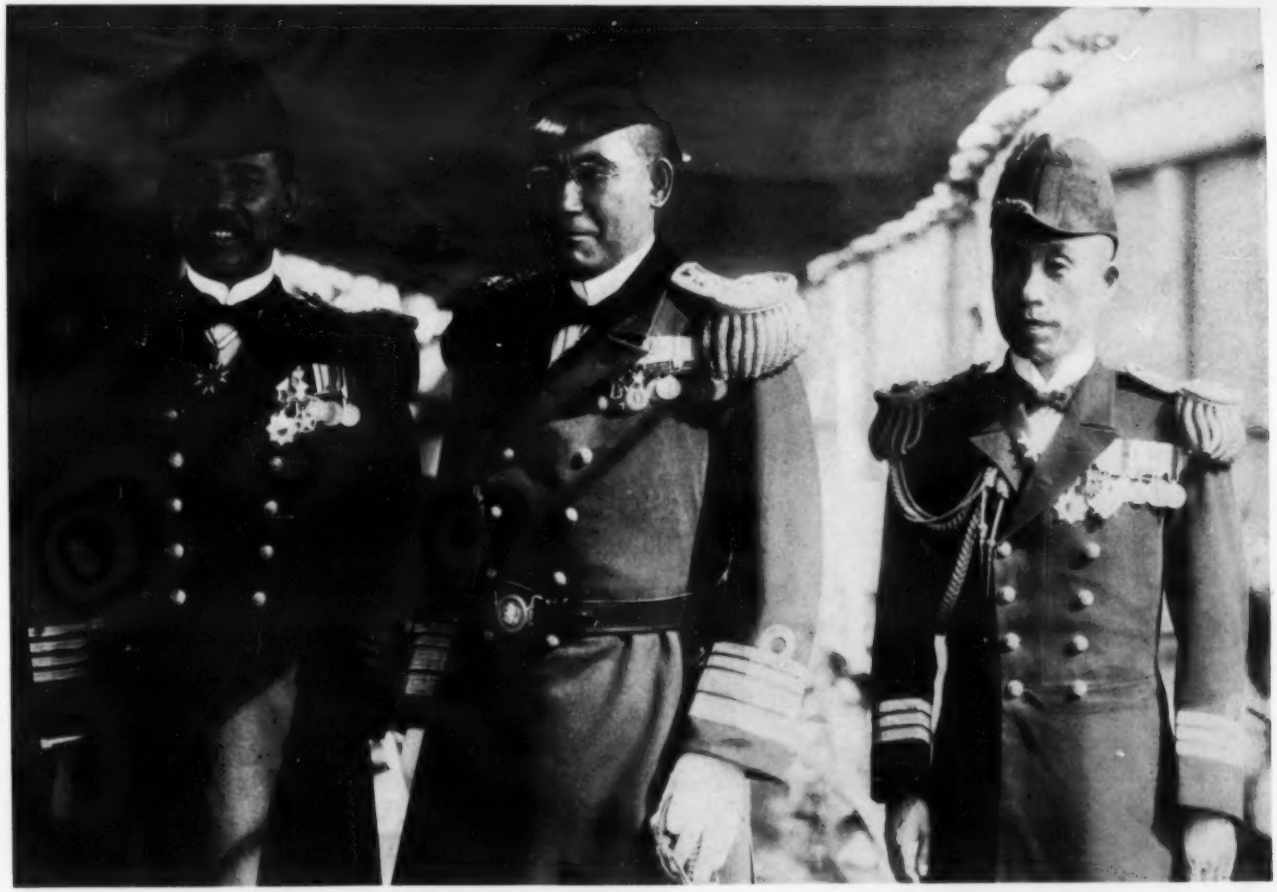
SECRETARY'S NOTES

AN ANSWER TO AN OPEN LETTER

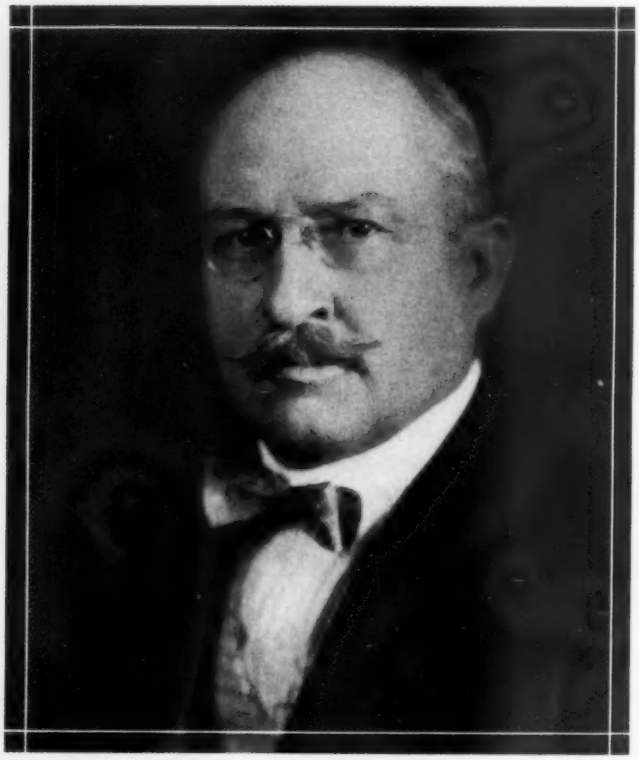
At least two newspapers, the New York *Times* and the Baltimore *Sun,* under date of June 24 published a letter addressed to me as President of the Naval Institute and purporting to have been signed by nine officials of the Federal Council of Churches. The body of the letter was a general denial of that part of Captain Knox's article entitled "The Navy and Public Indoctrination" (Naval Institute PROCEEDINGS, June, 1929) which referred to the Federal Council of Churches and its activities. The letter was dated June 22 and a covering letter of the same date was sent to me by the General Secretary of the Federal Council together with a copy of that given the newspapers with the demand that the PROCEEDINGS publish it. The nine officials who were said to have signed the letter of June 22, all of whom finally did sign a letter the original of which reached me about July 10, were:

Luther A. Weigle, chairman Administrative Committee.
Charles H. Tuttle, vice-chairman Administrative Committee.
Robert A. Ashworth, vice chairman Administrative Committee.
George W. Wickersham, chairman Commission on International Justice and Goodwill
Orrin R. Judd, chairman Board of Finance.
Frank H. Mann, treasurer.
Charles S. Macfarland, general secretary and secretary Board of Finance.
Samuel McCrea Cavert, general secretary.
John Milton Moore, general secretary.

After some investigation I became of the opinion that the denials could not be accepted at their face value. I wrote a letter to the Administrative Committee of the Federal Council setting forth my reasons for not so accepting them. In my opinion all statements made by Captain Knox about the activities of the Federal Council, except the specific one that the Council received money from Sir Henry Lunn or from a foundation of his (which statement I consider not proved) are well founded, especially that part of Captain Knox's article (written in 1928) which reads: "Large sums of money are being spent by many powerful organizations in which foreigners play a prominent rôle to propagandize the country through the press, the church, the stage, the movies, the schools and colleges, the lecture platforms, and virtually every agency of communication. The declared object is the promotion of international good will and of world peace by controlling the United States Government through the control of American public opinion." The data from which my conclusion is drawn are too extensive to be printed in the PROCEEDINGS; but those who are interested and who have read Captain Knox's article and the newspapers containing the Council's denial can obtain further information and draw their own conclusions by



VICE ADMIRAL KICHISABURO NOMURA, I.J.N.
Commanding Japanese Naval Training Squadron, who recently visited Annapolis



George Clymer Stout, M.D.

BORN Bethlehem, Pennsylvania, June 29, 1862; graduated U. S. Naval Academy, 1883; served as lieutenant in the U. S. Navy during the Spanish-American War; honorably discharged September 8, 1898.

Graduated University of Pennsylvania Medical Department, 1891. Ever since has engaged in the practice of his profession in Philadelphia, specializing in ear, nose, and throat diseases. Late professor of otology, Philadelphia Polyclinic; late laryngologist and aurist, St. Mary's Hospital; late secretary Laryngological and Otological Section of the American Medical Association; past president of Philadelphia Medical Alumni of University of Pennsylvania. Late vice president American Laryngological, Rhinological and Otological Society and chairman of Eastern Section of the society. Late chief, and now consulting, laryngogolist of the Presbyterian Hospital, Philadelphia. Contributor to *Wood's Reference Handbook of the Medical Sciences* and *Taylor and Welles on Diseases of Children,* medical journals, etc. Chairman of Committee on Naval Recruiting during World War. Member of College of Physicians of Philadelphia, Philadelphia County Medical Society, American Medical Association, Historical Society of Pennsylvania, Naval Order of United States, Naval Academy Graduates Association, president Association of Founders of First Naval Battalion of Pennsylvania, Phi Alpha Sigma Fraternity, American Laryngological Association, Academy of Fine Arts, Pennsylvania Society Sons of the Revolution, etc., etc.

Has now practically retired from the practice of his profession.

studying the Federal Council's *Twenty Years of Church Federation,* 1928; the Federal Council's *Handbook of Churches,* 1927; *Pastors, Politicians, Pacifists* by Smith and Johns, first and second editions, 1927 and 1928; "Minutes of the Third and Fifth Biennial Conventions of the United Lutheran Church in America"; House Documents Nos. 233, 247, and 266 (1928); and various articles which have appeared in the *Army-Navy Register* and other papers relative to the Federal Council.

S. S. ROBISON

The Premier's visit

Premier MacDonald, of Great Britain, has come and gone. His reception in the United States was more than cordial, it was enthusiastic.

The Navy was interested in his visit on account of its bearing on the problem of naval armaments. Although most of the preliminary conversations on this subject had taken place and were in a manner known to the public, the Premier's visit went a long way towards smoothing the path to the conference to be held in London in January.

Of course, it may be expected that there will be differences of opinion when the five principal naval powers convene, yet there is every reason to hope that a suitable solution will be reached. And that is all the Navy asks for.

Death of a distinguished member

When Rear Admiral Albert Niblack, U. S. Navy, died, the Naval Institute lost one of its oldest members and one of its most enthusiastic supporters. Admiral Niblack joined the Institute in 1884, forty-five years ago.

At the time of his death, some six years after his retirement, he was director of the Hydrographic Bureau, at Monaco. His selection for this duty was not only a tribute to his own ability, but also an honor for the United States Navy.

Graduated from the Naval Academy in the Class of '79, Admiral Niblack continued actively engaged in his profession for fifty years. At his death he was given the highest honors by foreign governments as well as our own.

Good news

Beginning early in 1930, the PROCEEDINGS will publish another article by Colonel Otto, German archivist. This writer has already published an article in the PROCEEDINGS, "The Battle for the Possession of Belleau Woods." The forthcoming article will be the German account of the capture of Blanc Mont, by the 2nd Division, U. S. Army.

The Marine Corps will be very much interested in the account of this operation of the World War, for the corps played an important part in it. The article is of such length that it will have to be run serially through four or five issues of the PROCEEDINGS. We hope to start it in the January issue.

Colonel Otto has obtained some most interesting German photographs, and has prepared comprehensive maps; these, with illustrations from United States sources, will add greatly to the value of the article.

If you have any friends who served with the 2nd Division in the World War, advise them to join the Institute for 1930 in order to get this valuable contribution to the history of the war.

"We Build A Navy"

Some time ago, it was stated in these notes that arrangements had about been concluded for the Macmillan Company, publishers, to handle the sale of Frost's *We Build A Navy* to the public, other than the membership of the Institute. These negotiations have been discontinued by mutual agreement, and the Institute will handle all sales of this book.

If you will read what various reviewers have to say about the book (see advertisement) you will be convinced that it is an excellent piece of work.

It will make a splendid Christmas present!

Apology to "Time"

In the September issue of the PROCEEDINGS, page 824, Notes on International Affairs, we published an article on Far Eastern affairs, quoted from the Baltimore *Sun*. For illustrating this article, we used a map which was taken from *Time*, and for which we failed to give the usual courtesy.

We hope the editor of *Time* will forgive this unintentional discourtesy.